Final

City of Chicago – Department of Buildings Building Application – Storm Water Review Only

For the

Former Celotex Site

2800 South Sacramento Avenue/

3031 South Albany Avenue

Chicago, Illinois 60623

Prepared for

City of Chicago – Storm Water Permit Review

August 2008

CH2MHILL

CITY OF CHICAGO

DEPARTMENT OF BUILDINGS

Building Permit Application

USE BLACK INK:	HOLDS:			
DO NOT WRITE IN SHADED AREA		Y	N	
APPLICATION PERMIT NO.: 100253796	Stop Order(s):			Violations
DS APPLICATION NO.:	Landmark			Special Admin. Hold
DATE ISSUED:	Lakefront Prot.			Other
	Flood Plain			

1. GENERAL INFORMATION

(Provide Original House Number Certificate for new construction.)

Address: Please enter two if a corner property.

2800 S. Sacramento Ave and 3031 S. Albany Chicago, IL

Number of dwelling units, number of stories, building use, description of proposed work and parking:

Regrading, contouring of site slopes, fence installation, and installation of new stormwater management system

Enter permit number if revision to an existing permit:

Cost of Construction: $ 5,000,000

Property Index Number(s) (PIN) (required):

1. 16-25-309-012-0000
2. 16-25-309-014-0000
3. 16-25-309-015-0000
4. 16-25-309-016-0000
5. 16-25-309-017-0000

2. CLASSIFICATION BY OCCUPANCY: NA

	A Residential		D Open Air Assembly		H1 Storage Low Hazard
	A2 Residential		E Business		H2 Storage Moderate Hazard
	B Institutional		F Mercantile		H3 Garages
	C1 Assembly		Private Garage		1 Hazardous
	C2 Assembly		G1 Industrial Low Hazard		J Miscellaneous Building
	C3 Assembly		G2 Industrial Moderate Hazard		Technology Center

3A. BUILDING INFORMATION FOR EXISTING BUILDING: NA

	Const. Class.	No. Stories	Basements	No. D.U.	No. Comm. Units	Width	Length	Height	Area (sf)	Volume (cf)
Existing										

3B. BUILDING INFORMATION FOR NEW CONSTRUCTION (IF APPLICABLE):

	Const. Class.	No. Stories	Basements	No. D.U.	No. Comm. Units	Width	Length	Height	Area (sf)	Volume (cf)
Addition										
New Bldg. (Front or Rear)										
Detached Garage										
Fence							5,000'	6'		
Trash Enclosure										

3C. BUILDING INFORMATION FOR RENOVATION (IF APPLICABLE): NA

	Const. Class.	No. Stories	Basements	No. D.U.	No. Comm. Units	Width	Length	Height	Area (sf)	Volume (cf)
Area to be Renovated										

4. ZONING INFORMATION: (See Site Plan in Drawings of lot and buildings, showing dimensions, streets, alleys, setbacks, existing landscaping and north arrow.)

Plat of Survey:	Area of Lot:
Plate Number:	Height of Building:
Zoning District/P.D. #:	Area and Volume of Building:
Zoning Use:	Number of Parking Spaces:
Front or Rear Building:	Number of Loading Spaces:
Special Zoning Permission Required for Administrative Adjustment, Variance or Special Use: ☐ Yes ☐ No	
Case Number:	
Comments Section:	
Signature of Approval:	Date:

5. FIRE PREVENTION ITEMS:

	Yes	No	
Existing Sprinkler System		X	Flammable Liquids
Install Full Sprinkler System		X	Corrosive Liquids
Install Partial Sprinkler System (Designate Areas to be Sprinklered):		X	Hazardous Chemicals
Extend Existing Sprinkler System (Designate Areas to be Sprinklered):		X	Oxidizing Materials
Relocate Sprinkler Heads Only		X	Highly Flammable Materials
Existing Standpipe System		X	Fume Hazardous Gases
Install New Standpipe System		X	Flammable Compressed Gases
Existing Fire Alarm System (Choose One): _____ Class I _____ High Rise _____ Class II _____ Other, clarify		X	Dust Producing Equipment
Install New Fire Alarm System (Choose One): _____ Class I _____ High Rise _____ Class II _____ Other, clarify		X	Is this permit for modifications to the building in order to pass the Life Safety Evaluation as per code section 34 (13-196-206)?

6. MAYOR'S OFFICE FOR PEOPLE WITH DISABILITIES ITEMS

Is the project Government financed, subsidized or guaranteed? ☐ Yes ☒ No
If yes, specify type of funding: city, state or federal.

RENOVATION PROJECTS ONLY:
Provide total alteration cost in last 30 months using EAC / ERC = _____ %
EAC = Estimated Alteration Cost for Project Budget + Alteration Cost in Last 30 Months
ERC = Estimated Reproduction Cost = Work Area (sf) x New Construction Cost per sf

HOUSING PROJECTS ONLY (Submit Part II Letter of Approval at intake meeting, if applicable.):

Total Number of Dwellings Units: Multiple Dwellings:
Structure with Four or More Units: Single Family Residential (Detached):
Attached Multi-Story Single Family Residential Units with Separate Means of Egress:
Other:

	Proposed No. D.U.	Actual No. D.U.
Accessible Lodging Units [1107.5.1.1 (ANSI Section 1002)]		
Units with Communication Features [1107.5.1.1 (ANSI Section 1005)]		
Accessible Units with Communication Features [1107.5.1.1 (ANSI Section 1002 + 1005)]		
Type A [1107.5.2.2 (ANSI Section 1003)]		
Type B [1107.5.2.3 (ANSI Section 1004)]		
Type A & B with Conduit Lines [1107.5.2.4]		
Visitable [1107.5.4.3 and 1107.5.5.3]		
Attached Multi-Story SFR Units with Separate Means of Egress [1107.5.4.3 + 1107.5.5.3]		
Section 504 Accessible Units [1107.5.5.5.1 and (U.F.A.S. Sec. 4.34)]		
Section 504 Accessible Units with Communication Features [1107.5.5.5.2 and 1107.5.5.4 (ANSI Section 1005)]		
Zoning Incentive Building Type A Units [17-2-0304 A & B, 17-2-0306, 17-2-0311 A & A (a) (Zoning Code) (ANSI Section 1003)]		
Change of Occupancy (20+ Units)		

7. ENVIRONMENTAL ITEMS

	Yes	No		Yes	No
Boiler(s)		X	Dry Cleaning Machinery		X
Gas Fired Hot Water Heater(s)		X	Manufacturing Process Equipment and Control Devices		X
Gas Fired Package Rooftop, Furnaces		X	Manufacturing Process Equipment or Area, Hazardous/Flammable Storage		X
Unit Heaters or other Gas Fired HVAC Units		X	Air Pollution Control Devices		X
Unfired Pressure Vessel (Air Tanks, Heat Exchanger, Hot Storage Tanks)		X	Paint Spray Booth or Paint Spray Area		X
Commercial Cooking Equipment or Food Preparation Unit		X	Paint Spray Booth or Paint Spray Area in Motor Vehicle Repair Shop		X
Emergency Generator		X	New Incinerator or Afterburner Equipment		X
Underground/Aboveground Storage Tank Unit (Apply at DOE)		X	Sandblasting, Grinding of Masonry, or Chemical Cleaning of Any Architectural Surface		X
Compactor or Bailer		X			

8. REMARKS AND APPROVALS

Remarks By: Date:

Remarks By: Date:

Remarks By: Date:

Remarks By: Date:

Remarks By: Date:

Remarks By: Date:

Remarks By: Date:

9. CONTACT INFORMATION

Owner/Tenant/Agent: Samuel Palumbo (Monarch Parcel)

Lic. # _____ City Hillside

Address: 321 Center Street State: IL Zip Code: 60162

E-mail: _____ Telephone No: 708-544-9440

Emergency Contact: _____ Telephone No.: _____

Arch./Eng.: _____

Lic. #: _____ City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

General Contractor: CH2M Hill Constructors, Inc.

Lic. #: TG-C04805 City: Englewood

Address: 9191 South Jamaica St. State: Colorado Zip Code: 80112

E-mail: _____ Telephone No: 720-286-2422

Mason Contractor: _____

Lic. #: _____ A, B, or C City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

Electrical Contractor: _____

Lic. #: _____ City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

Vent/Heat Contractor: _____

Lic. #: _____ City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

Refrig./AC Contractor: _____

Lic. #: _____ City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

Plumbing Contractor: _____

Lic. #: _____ City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

Expeditor: _____

Lic. #: _____ City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

Local Arch./Eng.:* _____

Lic. #: _____ City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

(*If your licensed Architect is not located in the State of Illinois, you have the option to identify a local Illinois Architect to represent you at DOB to attend meetings and attend Open Plan Review.)

WARNING TO PROPERTY OWNER/TENANT AND GENERAL CONTRACTOR

I, Samuel S. Palumbo, Jr., as property owner/tenant, and I, _____, as general contractor, understand that it is against the law to exceed the scope of a building permit. I understand that if I build, or allow anyone else to build, any building, room addition, structure or other object that differs from, or in any way exceeds, what this permit authorizes me to build, I can and will be **severely punished.** I understand that if I exceed, or allow anyone else to exceed, the scope of this building permit, I can have my **permit revoked**; be ordered to **stop all work** on the project; **fined** up to $5,000.00 per day; imprisoned for up to six months; required to do up to **100 hours of community service**; required to **tear down at my own expense** all completed work; and, in addition to any other penalties provided by law, required to **reimburse the City** up to three times any damages incurred for providing any false or inaccurate information in this building permit application. I understand that all construction work under this proposed permit must conform to the requirements of the Chicago Building Code and, if it does not, I acknowledge that I can and will be **severely punished**.

Owner Signature _____ Date 8/08/08

-or- SAMUEL S. PALUMBO, JR., President, Monarch Asphalt Co.

Tenant Signature (if applicable) _____ Date _____

and-

General Contractor Signature _____ Date _____

CERTIFICATION BY PROPERTY OWNER/TENANT

I, Samuel S. Palumbo, Jr., as property owner/tenant, hereby certify that the statements in this application are true; that I have legal authority to do the work authorized by this proposed permit on the property identified in this Application; that all construction work under this proposed permit will conform to the requirements of the Chicago Building Code under possible penalty of prosecution; and that if the construction work authorized under this proposed permit does not conform to the requirements of the Chicago Building Code, I will do whatever is necessary to correct the Code violation. I understand that any false or inaccurate information contained in this Application may result in revocation of the building permit in addition to any other penalties provided by law. A false statement of material fact made on this Application may violate federal, state and/or local law, and may subject any person making such a statement to a range of civil and criminal penalties, such as a period of incarceration, fines, and an award to the City of up to three times any damages incurred. In addition, persons who submit false information are subject to denial of the requested City action.

Owner Signature _____ Date 8/08/08

-or- SAMUEL S. PALUMBO, JR., President, Monarch Asphalt, Co.

Tenant Signature (if applicable) _____ Date _____

Does the Owner require a Residential Real Estate Developer's License to do the proposed work at this address? Yes ___ No___

If yes, license number _____

CERTIFICATION BY EXPEDITOR

I, _____, as expeditor, hereby certify that the statements in this Application are true. I understand that any false or inaccurate information contained in this permit Application may result in revocation of the building permit in addition to any other penalties provided by law. A false statement of material fact made on this Application may violate federal, state and/or local law, and may subject any person making such a statement to a range of civil and criminal penalties, such as a period of incarceration, fines, and an award to the City of up to three times any damages incurred. In addition, persons who provide false information are subject to denial of the requested City action.

Signature of Expeditor _____ Expeditor No. _____ Date _____

CERTIFICATION BY DESIGN PROFESSIONAL

I, KEITH MOCKENHAUPT, as design professional, hereby certify that all information contained in this Application under item numbers 1, 2, 3A, 3B, 3C, 5, 6 and 7 is complete and accurate to the best of my knowledge. I understand that any false or inaccurate information contained in this Application may result in revocation of the building permit in addition to any other penalties provided by law. A false statement of material fact made on this Application may violate federal, state and/or local law, and may subject any person making such a statement to a range of civil and criminal penalties, such as a period of incarceration, fines, and an award to the City of up to three times any damages incurred. In addition, persons who provide false information are subject to denial of the requested City action.

_____ 08/19/08

Signature of Licensed Architect or Structural Engineer of Record — Date

081-005457

License Number

KEITH S. MOCKENHAUPT 081-005457 LICENSED STRUCTURAL ENGINEER STATE OF ILLINOIS Professional Seal

EXPIRES 11/30/08

WARNING TO PROPERTY OWNER/TENANT AND GENERAL CONTRACTOR

*

I, Samuel S. Palumbo, Jr., as property owner/tenant, and I, CH2M HILL, as general contractor, understand that it is against the law to exceed the scope of a building permit. I understand that if I build, or allow anyone else to build, any building, room addition, structure or other object that differs from, or in any way exceeds, what this permit authorizes me to build, I can and will be **severely punished.** I understand that if I exceed, or allow anyone else to exceed, the scope of this building permit, I can have my **permit revoked**; be ordered to **stop all work** on the project; **fined** up to $5,000.00 per day; imprisoned for up to six months; required to do up to **100 hours of community service**; required to **tear down at my own expense** all completed work; and, in addition to any other penalties provided by law, required to **reimburse the City** up to three times any damages incurred for providing any false or inaccurate information in this building permit application. I understand that all construction work under this proposed permit must conform to the requirements of the Chicago Building Code and, if it does not, I acknowledge that I can and will be **severely punished.**

Owner Signature _____ Date 8/08/08

-or- SAMUEL S. PALUMBO, Jr., President, Monarch Asphalt Co.

Tenant Signature (if applicable) _____ Date _____

and-

General Contractor Signature Matthew D. Kluge, CH2M HILL Date 8/13/08

CERTIFICATION BY PROPERTY OWNER/TENANT

I, Samuel S. Palumbo, Jr., as property owner/tenant, hereby certify that the statements in this application are true; that I have legal authority to do the work authorized by this proposed permit on the property identified in this Application; that all construction work under this proposed permit will conform to the requirements of the Chicago Building Code under possible penalty of prosecution; and that if the construction work authorized under this proposed permit does not conform to the requirements of the Chicago Building Code, I will do whatever is necessary to correct the Code violation. I understand that any false or inaccurate information contained in this Application may result in revocation of the building permit in addition to any other penalties provided by law. A false statement of material fact made on this Application may violate federal, state and/or local law, and may subject any person making such a statement to a range of civil and criminal penalties, such as a period of incarceration, fines, and an award to the City of up to three times any damages incurred. In addition, persons who submit false information are subject to denial of the requested City action.

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Owner Signature _____ Date 8/08/08

-or- SAMUEL S. PALUMBO, Jr., President, Monarch Asphalt, Co.

Tenant Signature (if applicable) _____ Date _____

Does the Owner require a Residential Real Estate Developer's License to do the proposed work at this address? Yes ___ No___

If yes, license number _____

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Signature of Expeditor _____ Expeditor No. _____ Date _____

CERTIFICATION BY DESIGN PROFESSIONAL

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_____ 09/19/08

Signature of Licensed Architect or Structural Engineer of Record — Date

081-005457

License Number

KEITH S. MOCKENHAUPT
081-005457 Professional Seal
LICENSED
STRUCTURAL
ENGINEER
STATE OF ILLINOIS

Expires 11/30/09

9. CONTACT INFORMATION

Owner/Tenant/Agent: Rich Urso (Sacramento Parcel)

Lic. # _____ City Chicago

Address: 4222 South Knox Avenue State: IL Zip Code: 60632

E-mail: _____ Telephone No: 773-585-2550

Emergency Contact: _____ Telephone No.: _____

Arch./Eng.: _____

Lic. #: _____ City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

General Contractor: CH2M Hill Constructors, Inc.

Lic. #: TG-C04805 City: Englewood

Address: 9191 South Jamaica St. State: Colorado Zip Code: 80112

E-mail: _____ Telephone No: 720-286-2422

Mason Contractor: _____

Lic. #: _____ A, B, or C City: _____

Address: _____ State: _____ Zip Code: _____

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Electrical Contractor: _____

Lic. #: _____ City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

Vent/Heat Contractor: _____

Lic. #: _____ City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

Refrig./AC Contractor: _____

Lic. #: _____ City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

Plumbing Contractor: _____

Lic. #: _____ City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

Expeditor: _____

Lic. #: _____ City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

Local Arch./Eng.:* _____

Lic. #: _____ City: _____

Address: _____ State: _____ Zip Code: _____

E-mail: _____ Telephone No: _____

(*If your licensed Architect is not located in the State of Illinois, you have the option to identify a local Illinois Architect to represent you at DOB to attend meetings and attend Open Plan Review.)

WARNING TO PROPERTY OWNER/TENANT AND GENERAL CONTRACTOR

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Owner Signature _____ Date 8-8-08

-or-

Tenant Signature (if applicable) _____ Date _____

and-

General Contractor Signature _____ Date _____

CERTIFICATION BY PROPERTY OWNER/TENANT

I, Richard Urso, as property owner/tenant, hereby certify that the statements in this application are true; that I have legal authority to do the work authorized by this proposed permit on the property identified in this Application; that all construction work under this proposed permit will conform to the requirements of the Chicago Building Code under possible penalty of prosecution; and that if the construction work authorized under this proposed permit does not conform to the requirements of the Chicago Building Code, I will do whatever is necessary to correct the Code violation. I understand that any false or inaccurate information contained in this Application may result in revocation of the building permit in addition to any other penalties provided by law. A false statement of material fact made on this Application may violate federal, state and/or local law, and may subject any person making such a statement to a range of civil and criminal penalties, such as a period of incarceration, fines, and an award to the City of up to three times any damages incurred. In addition, persons who submit false information are subject to denial of the requested City action.

Owner Signature _____ Date 8-8-08

-or-

Tenant Signature (if applicable) _____ Date _____

Does the Owner require a Residential Real Estate Developer's License to do the proposed work at this address? Yes ___ No___

If yes, license number _____

CERTIFICATION BY EXPEDITOR

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Signature of Expeditor _____ Expeditor No. _____ Date _____

CERTIFICATION BY DESIGN PROFESSIONAL

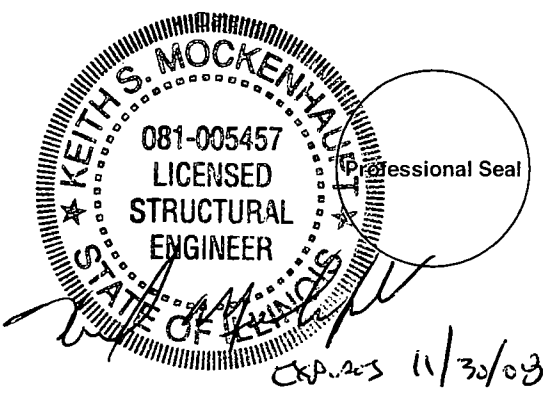
I, Keith Mockenhaupt, as design professional, hereby certify that all information contained in this Application under item numbers 1, 2, 3A, 3B, 3C, 5, 6 and 7 is complete and accurate to the best of my knowledge. I understand that any false or inaccurate information contained in this Application may result in revocation of the building permit in addition to any other penalties provided by law. A false statement of material fact made on this Application may violate federal, state and/or local law, and may subject any person making such a statement to a range of civil and criminal penalties, such as a period of incarceration, fines, and an award to the City of up to three times any damages incurred. In addition, persons who provide false information are subject to denial of the requested City action.

_____ 03/19/08

Signature of Licensed Architect or Structural Engineer of Record

081-005457

License Number



WARNING TO PROPERTY OWNER/TENANT AND GENERAL CONTRACTOR

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Owner Signature _____ Date 7 x : 8

-or-

Tenant Signature (if applicable) _____ Date _____

and-

General Contractor Signature Matthew D. Kluge, CH2M HILL Date 8/13/08

CERTIFICATION BY PROPERTY OWNER/TENANT

I, Richard Ures, as property owner/tenant, hereby certify that the statements in this application are true; that I have legal authority to do the work authorized by this proposed permit on the property identified in this Application; that all construction work under this proposed permit will conform to the requirements of the Chicago Building Code under possible penalty of prosecution; and that if the construction work authorized under this proposed permit does not conform to the requirements of the Chicago Building Code, I will do whatever is necessary to correct the Code violation. I understand that any false or inaccurate information contained in this Application may result in revocation of the building permit in addition to any other penalties provided by law. A false statement of material fact made on this Application may violate federal, state and/or local law, and may subject any person making such a statement to a range of civil and criminal penalties, such as a period of incarceration, fines, and an award to the City of up to three times any damages incurred. In addition, persons who submit false information are subject to denial of the requested City action.

Owner Signature _____ Date 7 x : 8

-or-

Tenant Signature (if applicable) _____ Date _____

Does the Owner require a Residential Real Estate Developer's License to do the proposed work at this address? Yes ___ No___

If yes, license number _____

CERTIFICATION BY EXPEDITOR

I, _____, as expeditor, hereby certify that the statements in this Application are true. I understand that any false or inaccurate information contained in this permit Application may result in revocation of the building permit in addition to any other penalties provided by law. A false statement of material fact made on this Application may violate federal, state and/or local law, and may subject any person making such a statement to a range of civil and criminal penalties, such as a period of incarceration, fines, and an award to the City of up to three times any damages incurred. In addition, persons who provide false information are subject to denial of the requested City action.

Signature of Expeditor _____ Expeditor No. _____ Date _____

CERTIFICATION BY DESIGN PROFESSIONAL

I, Keith Mockenhaupt, as design professional, hereby certify that all information contained in this Application under item numbers 1, 2, 3A, 3B, 3C, 5, 6 and 7 is complete and accurate to the best of my knowledge. I understand that any false or inaccurate information contained in this Application may result in revocation of the building permit in addition to any other penalties provided by law. A false statement of material fact made on this Application may violate federal, state and/or local law, and may subject any person making such a statement to a range of civil and criminal penalties, such as a period of incarceration, fines, and an award to the City of up to three times any damages incurred. In addition, persons who provide false information are subject to denial of the requested City action.

Signature of Licensed Architect or Structural Engineer of Record

08/19/09
Date

081-005457
License Number

KEITH S. MOCKENHAUPT
081-005457
LICENSED
STRUCTURAL
ENGINEER
STATE OF ILLINOIS

Professional Seal

Expires 11/30/09

CITY OF CHICAGO

DEPARTMENT OF BUILDINGS

Excavation Certification

Property address 3031 South Albany Ave. Chicago, IL 60623 **App. #:** _____

I. NOTICE AND POSTING REQUIREMENTS

At least 30 days prior to beginning the excavation work, the owner or the property where the work is to be done shall notify the owners of adjacent properties of the anticipated starting date and three-dimensional measurement of the excavation work. The notice shall be in writing, and shall be delivered by certified mail, return receipt requested, or by personal delivery to the person entitled to receive the notice, accompanied by a receipt for delivery. The receipt and a copy of the notice shall be available for inspection at the excavation site.

This form, signed and sealed by the design professional, shall be available at the project site. Seventy-two hours prior to excavation, Department of Buildings shall be notified at 312/744-3400.

II. INSURANCE

The excavator must have an appropriate license from the City of Chicago and maintain a comprehensive liability insurance policy of $1,000,000 per occurrence.

(Provide following information and attach certificate of insurance.)

Excavator name: CH2MHill Constructors, Inc. License #: TGC04805

I, ***the owner***, hereby attest that the foregoing information is true and correct to the best of my knowledge and belief.

→ [signature] / 321 Center Street / Hillside / IL / 60162

(Owner signature) (Street address) (City) (State) (Zip)

SAMUEL S. PALUMBO, JR., President. Monarch Asphalt Co.

III. DESIGN PROFESSIONAL CERTIFICATION	Yes	No
In the opinion of an Illinois licensed architect or structural/professional engineer, does this project require any reinforcement or bracing of the adjacent property? *(If yes, the rules require that an architect or engineer be responsible for designing such system and obtaining any necessary permit.)*	☐	☒

I, ***the design professional***, hereby attest that the foregoing information in paragraph III is true and correct to the best of my knowledge and belief.

→ [signature] / 6315 N. SPRINGFIELD AVE / CHICAGO / IL / 60659

(Architect/Engineer signature) (Street address) (City) (State) (Zip)

KEITH S. MOCKENHAUPT
081-005457
LICENSED
STRUCTURAL
ENGINEER
STATE OF ILLINOIS
ink seal
Expires 11/30/09

City of Chicago
Richard M. Daley, Mayor

196449-19-EL-11/07

1/17/06

CITY OF CHICAGO

DEPARTMENT OF BUILDINGS

Excavation Certification

Property address 2800 S. Sacramento Ave., Chicago, IL **App. #:** _____

I. NOTICE AND POSTING REQUIREMENTS

At least 30 days prior to beginning the excavation work, the owner or the property where the work is to be done shall notify the owners of adjacent properties of the anticipated starting date and three-dimensional measurement of the excavation work. The notice shall be in writing, and shall be delivered by certified mail, return receipt requested, or by personal delivery to the person entitled to receive the notice, accompanied by a receipt for delivery. The receipt and a copy of the notice shall be available for inspection at the excavation site.

This form, signed and sealed by the design professional, shall be available at the project site. Seventy-two hours prior to excavation, Department of Buildings shall be notified at 312/744-3400.

II. INSURANCE

The excavator must have an appropriate license from the City of Chicago and maintain a comprehensive liability insurance policy of $1,000,000 per occurrence.

(Provide following information and attach certificate of insurance.)

Excavator name: CH2M Hill Constructors, Inc. License #: TGC04805

I, ***the owner,*** hereby attest that the foregoing information is true and correct to the best of my knowledge and belief.

→ _____ / 4222 S. Knox / Chicago / IL / 60632

(Owner signature) (Street address) (City) (State) (Zip)

III. DESIGN PROFESSIONAL CERTIFICATION	Yes	No
In the opinion of an Illinois licensed architect or structural/professional engineer, does this project require any reinforcement or bracing of the adjacent property? *(If yes, the rules require that an architect or engineer be responsible for designing such system and obtaining any necessary permit.)*	☐	☒

I, ***the design professional***, hereby attest that the foregoing information in paragraph III is true and correct to the best of my knowledge and belief.

→ _____ / 6315 N. Springfield Ave / Chicago / IL / 60659

(Architect/Engineer signature) (Street address) (City) (State) (Zip)

ink seal

KEITH S. MOCKENHAUPT
081-005457
LICENSED STRUCTURAL ENGINEER
STATE OF ILLINOIS

Expires 11/30/08

City of Chicago
Richard M. Daley, Mayor

1/17/06

196449-19-EL-11/07

Permit Application – Technical Portion

Stormwater Permit Application

PREPARED FOR: The Department of Buildings
Sewer Permit Section - City Hall
121 North LaSalle Street, Suite 804
Chicago, IL 60602

PREPARED BY: CH2M HILL

DATE: August 13, 2008

CC: The Wetlands Initiative: c/o Jill Kostel
City of Chicago Department of Water Management: c/o Pete Mulvaney
USEPA: c/o Jena Sleboda
Honeywell International Inc: c/o Chuck Geadelmann, Bill Hague

1.0 Introduction

This technical memorandum, and associated tables and attachments, constitutes the stormwater permit application for the former Celotex Main Site. The objective of this application is to obtain a stormwater permit for a re-grading and capping project at the 2800 South Sacramento Avenue property. The purpose of the project is to place a cover of clean material over the former industrial site to support future use. The project is being conducted by Honeywell International Inc (Honeywell) under directive of USEPA. The project site is not currently owned by Honeywell, but was in the past and they are the responsible party for this work.

The project site is a 21.6 acre former industrial site known as the Celotex site located at 2800 South Sacramento Avenue, Chicago, IL. The site is subdivided into two parcels with two different owners. The larger parcel (approximately 20 acres), located to the north, is referred to as the Sacramento parcel, while the smaller parcel (approximately 2 acres), located to the south (3031 South Albany Avenue) is referred to as the Monarch parcel. The Sacramento parcel currently serves as a compacted gravel parking lot for semi trucks and trailers. The Monarch parcel is currently vacant with a compacted gravel surface.

The main goal of this project is to place a cover of clean material over the Sacramento and Monarch parcels to meet USEPA requirements. Additionally, the City of Chicago Parks Department is attempting to purchase these two parcels to convert them into a park. To meet USEPA requirements, clean material will be added to each parcel so that a 24 inch layer separates the surface from potentially impacted materials. The type of clean material will vary depending upon the location and will include vegetated topsoil and aggregate covers.

The Sacramento parcel's ultimate land use is in question pending the outcome of the City of Chicago Parks Department's efforts to purchase the properties. The construction plan allows for two options for the Sacramento parcel. The first is to have the Sacramento parcel cover material be gravel, similar to what currently exists. The second option is for the Sacramento

parcel cover to be soil and grass. The Monarch parcel is planned to be a parking lot. The Parks Department may install porous pavement in the parking area in the future. This project will lay the base aggregate for a future porous pavement system. An analysis of each of these options has been included to demonstrate the stormwater requirements have been met with either option.

The Sacramento parcel has two drainage catchment areas (1 north and 1 south) in addition to side slope drainage (Attachment 1). The Monarch parcel has one catchment area of 1.6 acres in addition to side slope drainage under proposed conditions. The northern Sacramento catchment is approximately 3.2 acres while the southern catchment is approximately 13.3 acres. The Sacramento parcel has approximately 3.1 acres of side slopes that drain to areas other than the Monarch parcel. Except for the northern and western side slopes of the site, the northern catchment currently drains to the Whipple Street sewer (owned by City of Chicago) to the east of the site. Except for the site side slopes, the southern catchment currently drains to the same sewer as the Monarch catch basin and all flow drains from that point west to the Albany Avenue sewer (owned by the City of Chicago). Under existing conditions, side slopes drain to adjacent properties or rights of way for storms when the perimeter swale overtops.

2.0 Stormwater Project Overview

2.1 Design Intention

The project will abandon existing stormwater pipes on both parcels and install new pipes to direct stormwater to the combined sewer overflow (CSO) outfall #178 to the Collateral channel south of the Monarch parcel. New stormwater pipes will discharge to outfall #178 just downstream of the tide gate (see drawings in Attachment 2). Except for side slope drainage that does not have catch basins, the project will remove all stormwater from the project site from the City's combined sewer system. Existing discharge rates will be met as much as possible to create no negative impact upon the sewer system. Removing the water from the combined sewer system should lead to increased sewer capacity to convey flows upstream of the tide gate near CSO outfall #178.

2.2 Modeling Approach

Because of the large size of the site and potential complexity of calculating flow rates, storage, and combining the drainage from the northern end of Sacramento (Subarea 2) with the flows from Sacramento Subarea 1 and Monarch, the site has been modeled with HEC-HMS. Total area modeled through HEC-HMS is 21.6 acres.

2.3 Rate Control

Restrictors will be placed in each of 6 new catch basins to provide rate control and onsite storage (see drawings in Attachment 2 for restrictor sizes and locations). The maximum release rate from the project site to the constructed wetland will be 10.3 cfs (0.48 cfs/acre) or less for the 100-year return period storm (see attached restrictor calculations in Attachment 3). This release rate meets the City's maximum release rate of 1 cfs/acre for sites discharging to waterways as well as the maximum release rate of 0.75 cfs/acre from open areas conducive to ponding. The maximum release rate from the project site from perimeter

swales not adjacent to street right of way ranges from zero from the 2-year event to 3.0 cfs from the 100-year event. These overflow rates along with the release rate of 10.3 cfs is less than the existing maximum release rate from the site of 19.0 cfs when the discharge to Albany and Whipple are combined.

3.0 Existing Condition

3.1 Land Use

The Sacramento and Monarch parcels are currently covered with compacted gravel. The Sacramento parcel is utilized as a parking area for semi trucks and trailers. The Monarch parcel is currently vacant with compacted gravel. The SCS Curve Number method was used to determine runoff numbers and the TR-55 method was used to determine time of concentration. A minimum value of no less than 6 minutes (0.1 hours) was used for time of concentration, following TR-55 guidance. Table 1 below summarizes these values for each subarea.

TABLE 1
Existing Conditions Land Use

Drainage Area	Curve Number	Time of concentration (min)	Area (acres)
Sacramento Subarea 1	89	10	13.3
Sacramento Subarea 2	89	8	3.2
Monarch	89	6	2.0
SS1	78	6	0.409
SS2	78	6	0.961
SS3N	78	6	0.279
SS3S	78	6	0.317
SS4N	78	6	0.371
SS4S	78	6	0.336
SS5	78	6	0.187
SS8	78	6	0.257

SS = Side slopes.

3.2 Drainage Areas

The following distinct drainage areas exist on the project site.

1. Sacramento subarea 1 (13.3 acres) – Drains to Albany Avenue Sewer
2. Sacramento subarea 2 (3.2 acres) – Drains east to Whipple Street Sewer
3. Monarch (2.0 acres) - Drains to Albany Avenue Sewer

4. Sacramento side slopes (3.1 acres) – Drains to grassed swales and then offsite in various directions when the swales overflow

Total Project Site Area: 21.6 acres

Three general flow paths exist for the site, as shown in the modeling schematics in Attachment 3. Flow leaves north and east of the site both through drainage through a stormsewer inlet as well as when the existing swale overflows.

3.3 Flow Rates

Flow rates were analyzed for Sacramento subarea 1, subarea 2, and Sacramento side slopes as well as Monarch using HEC-HMS running a Huff distribution for precipitation values in Bulletin 70. Storms for the 2-, 10-, 50-, and 100-year return period events over durations of 1-, 3-, 6-, 12-, and 24-hours were analyzed. Input, output, and model schematics are shown in Attachment 3. Restrictions, such as pipe size and slope that could reduce runoff rates from the site were considered along with ponding that could occur at the Sacramento parcel inlets. The existing condition runoff results are shown in Table 2 and Table 3.

Under existing conditions, the side slopes have some small storage capability from a ditch that runs along the perimeter of portions of the site. Once the ditch fills with runoff and overtops, the water runs off onto neighboring properties, including: street rights-of-way, private property, and alley rights-of-way. The runoff from these areas was modeled with HEC-HMS and while some infiltration will occur, for modeling purposes zero infiltration was assumed to be conservative. The major difference between existing and proposed conditions is a larger swale is being constructed under proposed conditions. Under most storm conditions, according to the results in Tables 2 and 3, no overtopping of the swales will occur. While there is some variation of the existing ditch around the site perimeter, the average condition is approximately represented by a two foot wide ditch, one foot deep with 2:1 side slopes.

Under existing conditions, the side slope swales start to overflow for the 10-, 50-, or 100-year storm depending upon the storm duration. Side slope swale calculations assumed a typical swale cross section to determine if overflow would occur. The peak flow rate estimated to leave the site through swale overflow under existing conditions is 4.2 cfs.

Ponding depths include:

- Zero to 2.8 feet between the 2- and 100-year storms in Subarea 1 on Sacramento (south)
- Zero to 2.3 feet between the 2- and 100-year storms for Subarea 2 on Sacramento (north)

TABLE 2
Existing Conditions Peak Flow Rate (cfs)
Former Celotex Main Site

	1 Hour Duration				3 Hour Duration				6 Hour Duration				12 Hour Duration				24 Hour Duration			
Area	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**
To Albany Avenue Sewer (South West of site)	10.0	10.4	14.4	16.8	10.2	10.1	11.8	13.0	9.0	10.2	10.2	11.1	5.7	9.8	10.2	10.2	3.5	5.9	9.2	10.2
To Whipple Street Sewer through Catch Basin (NE of site)	1.0	1.1	1.1	1.1	1.0	1.1	1.1	1.1	1.0	1.1	1.1	1.1	1.0	1.0	1.1	1.1	0.7	1.0	1.1	1.1
To Whipple Street through Direct Runoff (NE of site side swale overflow)	0.0	0.0	0.0	1.1	0.0	0.0	1.3	2.3	0.0	0.0	1.2	2.1	0.0	0.2	1.1	1.5	0.0	0.2	0.7	0.9
Direct Runoff to South West of Site (side swale runoff)	0.0	0.0	0.0	0.9	0.0	0.0	0.9	1.9	0.0	0.1	0.9	1.8	0.0	0.2	1.0	1.6	0.0	0.2	0.8	0.9
Precip (inches)	1.43	2.1	3.04	3.56	1.94	2.86	4.14	4.85	2.28	3.35	4.85	5.68	2.64	3.89	5.62	6.59	3.04	4.47	6.46	7.58

TABLE 3
Existing Conditions Peak Ponding Elevation
Former Celotex Main Site

	1 Hour Duration				3 Hour Duration				6 Hour Duration				12 Hour Duration				24 Hour Duration			
Area	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**
Existing																				
Subarea1	596.1	596.7	597.2	597.4	596.1	596.7	597.3	597.6	593.5	596.5	597.2	597.5	591.1	594.3	596.9	597.2	590.2	591.2	593.7	596.5
Subarea 2	597.3	597.9	598.2	598.3	597.4	598.0	598.3	598.5	597.2	598.0	598.3	598.5	597.0	597.6	598.2	598.4	594.8	597.1	598.0	598.2
Monarch	n/a																			
Precip (inches)	1.43	2.1	3.04	3.56	1.94	2.86	4.14	4.85	2.28	3.35	4.85	5.68	2.64	3.89	5.62	6.59	3.04	4.47	6.46	7.58

Note: side slope swale peak overflow is estimated at 4.2 cfs.

4.0 Proposed Condition Sacramento Gravel Cover Alternative

4.1 Land Use

Under this base alternative, the Sacramento subareas 1 and 2 will be covered with gravel. The Monarch parcel will be covered with aggregate for a porous pavement parking lot. The Monarch parcel has side slopes and grass swales under proposed conditions. As reflected by the curve number values, the land use is essentially the same as existing conditions, except Monarch is to be paved in the future. Table 4 below summarizes these parameters.

TABLE 4
Proposed Conditions Land Use (Gravel Surface Option)

Drainage Area	Curve Number	Time of concentration (min)	Area (acres)
Subarea 1	89	10	13.3
Subarea 2	89	8	3.2
Monarch	98	6	1.6
SS1	78	6	0.409
SS2	78	6	0.961
SS3N	78	6	0.279
SS3S	78	6	0.317
SS4N	78	6	0.371
SS4S	78	6	0.336
SS5	78	6	0.187
SS6 (Monarch)	78	6	0.257
SS7 (Monarch)	78	6	0.129
SS8	78	6	0.257

SS = Side slopes.

4.2 Drainage Areas

Under proposed conditions, Monarch as well as Sacramento Subarea 1, Subarea 2, and several side slopes (SS4, SS7, and SS8) are included together and connected to the CSO Outfall #178 downstream of the tide gate. This reduces flow to the combined sewer system and provides wetland treatment of the runoff from the site surface. Other side slopes that are adjacent to public right of way eventually fill up and overflow. Side slope SS1, however, is adjacent to private property and includes an enlarged swale to improve conditions from what currently exists and holds the runoff from a 100-year return period storm. SS1 was evaluated to also be connected to Outfall #178, but this was not feasible. It was not feasible to connect to Outfall #178 because it would have required lowering the enter sewer profile

and would have resulted in clearance conflicts at the downstream end (see drawings in Appendix 4) Consequently, side slope SS4 was enlarged to contain the 100-year runoff.

There are 8 distinct drainage areas on the project site with drainage as identified below

1. Sacramento subarea 1 (13.3 acres) - Drains to Outfall #178
2. Sacramento side slope (SS1 - 0.409 acres) - Drains to enlarged grassed swale and infiltrates or evaporates
3. Sacramento side slopes (SS4, SS8 - 0.964 acres) - Drains to Outfall #178
4. Sacramento side slopes (SS2, SS3, and SS5 - 1.744 acres) - Contained within enlarged grass swale for small events and overtops for larger events to public right of way
5. Sacramento subarea 2 (3.2 acres) - Drains to Outfall #178
6. Monarch (1.6 acres) - Drains to Outfall #178
7. Monarch side slope (SS6 - 0.257 acres) - Contained within enlarged grass swale for small events and overtops for larger events to public right of way
8. Monarch side slope (SS7 - 0.129 acres) - Drains to Outfall #178

4.3 Flow Rates

Flow rates were again analyzed using HEC-HMS. Restrictions on runoff were designed to limit the runoff to at or below existing conditions whenever practical. Restrictions cause ponding in the porous pavement or on the ground surface. The major difference between existing and proposed conditions is a larger swale is being constructed under proposed conditions. Under the 2-year and smaller storm conditions, no runoff beyond the swales will occur. The maximum total runoff to right of way from the swales is 3.0 cfs. The proposed condition runoff results are shown in Table 5 and Table 6 below.

TABLE 5
Proposed Conditions Peak Flow Rate (cfs) (Gravel Surface Option) (SubArea 1 - 9" restriction, Subarea 2- 4" restriction, Monarch - 6" restrictor, SS4, SS7, and SS8 all have 6" restrictors)
Former Celotex Site

	1 Hour Duration				3 Hour Duration				6 Hour Duration				12 Hour Duration				24 Hour Duration			
Area	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**
To Outfall #178 (SW of site)	8.5	9.1	10.0	10.3	8.5	9.2	10.0	10.3	7.8	9.0	9.8	10.1	6.9	8.1	9.4	9.7	4.4	7.0	8.2	8.7
To Whipple Street through Direct Runoff (NE of site side swale overflow)	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.6	0.0	0.0	0.9	1.5	0.0	0.2	0.8	1.4	0.0	0.1	0.7	0.9
Direct Runoff to South West of Site (side swale runoff)	0.0	0.0	0.6	0.9	0.0	0.1	0.8	1.4	0.0	0.1	0.6	0.8	0.0	0.2	0.4	0.6	0.0	0.1	0.2	0.3
Precip (inches)	1.43	2.1	3.04	3.56	1.94	2.86	4.14	4.85	2.28	3.35	4.85	5.68	2.64	3.89	5.62	6.59	3.04	4.47	6.46	7.58

TABLE 6
Proposed Peak Ponding Elevation (Gravel Surface Option)
Former Celotex Site

	1 Hour Duration				3 Hour Duration				6 Hour Duration				12 Hour Duration				24 Hour Duration			
Area	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**
Subarea1	597.1	597.8	598.3	598.5	597.1	597.9	598.4	598.7	596.9	597.6	598.3	598.6	595.7	597.2	598.1	598.4	592.5	595.8	597.4	597.9
Subarea 2	598.3	598.9	599.2	599.3	598.4	599.0	599.3	599.5	598.2	598.9	599.3	599.5	598.0	598.6	599.2	599.4	595.4	598.1	598.9	599.1
Monarch	592.4	592.6	592.8	592.9	592.3	592.5	592.7	592.8	591.3	592.3	592.5	592.6	590.1	590.9	592.3	592.4	589.7	590.0	590.4	590.9
Precip (inches)	1.43	2.1	3.04	3.56	1.94	2.86	4.14	4.85	2.28	3.35	4.85	5.68	2.64	3.89	5.62	6.59	3.04	4.47	6.46	7.58

4.4 Rate Control

Table 2 shows that the existing peak flow rate to the Albany Avenue sewer for any storm is 16.8 cfs, while the peak flow rate to the Whipple Street sewer to the east is 1.1 cfs. Under proposed conditions there is no direct flow to either of these sewers because connections to those sewers will be abandoned in lieu of a connection to Outfall #178. The peak flow rate to Outfall #178 for any storm from the project site under proposed conditions is 10.3 cfs (Table 5).

Under existing conditions 16.8 cfs from the site would flow to the Albany diversion structure under peak flow conditions. Changing the flow to downstream of the tide gate on Outfall #178 reduces flow at the Albany diversion structure, reduces flow at the tide gate diversion structure, and reduces flow going through the tide gate. The peak flow for the 100-year storm going to Outfall #178 under proposed conditions is also only 61% of the peak flow leaving the site through the Monarch parcel under existing conditions. Ponding draws down in less than 72 hours. Porous pavement drains within 48 hours. Ponding information is shown in Attachment 4.

Ponding depths include:

- Zero to 2.9 feet between the 2- and 100-year storms in Subarea 1 on Sacramento (south)
- Zero to 2.3 feet between the 2- and 100-year storms for Subarea 2 on Sacramento (north)
- Zero on Monarch (never surcharges to within eight inches of catch basin because of porous pavement underdrains); if Monarch does not have porous pavement installed, the estimated ponding depth is 1.0 feet
- Zero to 1.4 feet between the 2- and 100-year storms for Sacramento side slope SS1
- Zero to 0.6 feet between the 2- and 100-year storms for Sacramento side slope SS4
- Zero to 0.4 feet between the 2- and 100-year storms for Sacramento side slope SS7
- The Sacramento side slope area SS1 has been designed to have a larger cross-sectional area than the other side slope areas.

Details of the side slope swales and other design aspects can be seen on the drawings in Attachment 4.

4.5 Volume Control

The project site is exempt from infiltration requirements as it is a contaminated former industrial site. (See 4.1.2 Infiltration Exception of DWM Regulations for Sewer Construction and Stormwater Management).

However, the project plan has included the potential for some volume control by planning for the possibility of porous pavement being utilized on the Monarch parcel.

4.6 Stormwater Quality

Stormwater quality benefits achieved by this project include:

- Filtration of stormwater by porous pavement on the Monarch parcel (the Parks Department may install porous pavement in the future)
- All stormwater will flow to a grassed swale or treatment wetland in the Collateral Channel

Currently, MWRDGC (Joe Schuessler) is working with The Wetland Initiative (TWI - Jill Kostel) to implement a constructed wetland (approximately 1 acre) in the northern portion of the Collateral Channel. We have been in contact with both Joe Schuessler and Jill Kostel about our project and are in agreement, in principle, on sending the stormwater to the treatment wetland. MWRDGC has also been contacted regarding the project.

5.0 Proposed Condition Sacramento Grass Cover Option

5.1 Land Use

Under this second option, the Sacramento subareas 1 and 2 will be covered with soil and grass. The Monarch parcel will be covered with aggregate for a porous pavement parking lot. As reflected by the curve number values, the amount of impervious area is significantly reduced under proposed conditions. Table 7 below summarizes these parameters.

TABLE 7
Proposed Conditions Land Use (Grassed Surface Option)

Drainage Area	Curve Number	Time of concentration (min)	Area (acres)
Sacramento Subarea 1	78	41	13.3
Sacramento Subarea 2	78	41	3.2
Monarch	98	6	1.6
SS1	78	6	0.409
SS2	78	6	0.961
SS3N	78	6	0.279
SS3S	78	6	0.317
SS4N	78	6	0.371
SS4S	78	6	0.336
SS5	78	6	0.187
SS6 (Monarch)	78	6	0.257
SS7 (Monarch)	78	6	0.129
SS8	78	6	0.257

TABLE 7
Proposed Conditions Land Use (Grassed Surface Option)

Drainage Area	Curve Number	Time of concentration (min)	Area (acres)
Sacramento Subarea 1	78	41	13.3
Sacramento Subarea 2	78	41	3.2
Monarch	98	6	1.6
SS1	78	6	0.409
SS2	78	6	0.961
SS3N	78	6	0.279
SS3S	78	6	0.317
SS4N	78	6	0.371
SS4S	78	6	0.336
SS5	78	6	0.187
SS6 (Monarch)	78	6	0.257
SS7 (Monarch)	78	6	0.129
SS8	78	6	0.257

SS= Side slopes.

5.2 Drainage Areas

The drainage areas and directions are the same as under the gravel surface option.

5.3 Flow Rates

Flow rates were again analyzed using HEC-HMS. Restrictions on runoff were designed to limit the runoff to at or below existing conditions whenever practical. Restrictions cause ponding in the porous pavement or on the ground surface. The major difference between existing and proposed conditions is a larger swale is being constructed under proposed conditions. Under the 2-year and smaller storm conditions, no runoff beyond the swales will occur. The maximum total runoff to right of way from the swales is 3.0 cfs. The proposed condition runoff results are shown in Table 8 and Table 9 below.

TABLE8
Proposed Conditions Peak Flow Rate (Grassed Surface Option) (SubArea 1 - 9" restriction, Subarea 2- 4" restriction, Monarch - 6" restrictor; Side Slopes SS4, SS7, and SS8 have 6" restrictors)
Former Celotex Site

	1 Hour Duration				3 Hour Duration				6 Hour Duration				12 Hour Duration				24 Hour Duration			
Area	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**
To Outfall #178 (SW of site)	6.1	8.6	9.5	9.8	6.7	8.8	9.7	10.1	5.5	8.6	9.5	9.9	4.2	7.5	9.1	9.5	2.9	5.4	7.9	8.4
To Whipple Street through Direct Runoff (NE of site side swale overflow)	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.6	0.0	0.0	0.9	1.5	0.0	0.2	0.8	1.4	0.0	0.1	0.7	0.9
Direct Runoff to South West of Site (side swale runoff)	0.0	0.0	0.6	0.9	0.0	0.1	0.8	1.4	0.0	0.1	0.6	0.8	0.0	0.2	0.4	0.6	0.0	0.1	0.2	0.3
Precip (inches)	1.43	2.1	3.04	3.56	1.94	2.86	4.14	4.85	2.28	3.35	4.85	5.68	2.64	3.89	5.62	6.59	3.04	4.47	6.46	7.58

TABLE 9
Proposed Conditions Peak Ponding Elevation (Grassed Surface Option)
Former Celotex Site

	1 Hour Duration				3 Hour Duration				6 Hour Duration				12 Hour Duration				24 Hour Duration			
Area	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**
Subarea1	593.2	596.8	597.6	598.0	594.2	597.1	598.0	598.2	593.4	597.0	597.7	598.2	592.1	596.0	597.5	598.0	591.4	593.4	596.9	597.4
Subarea 2	596.3	598.2	598.8	599.0	597.3	598.3	599.1	599.2	596.6	598.3	599.1	599.2	594.8	598.1	598.9	599.1	593.6	596.6	598.4	598.9
Monarch	592.4	592.6	592.8	592.9	592.3	592.5	592.7	592.8	591.3	592.3	592.5	592.6	590.1	590.9	592.3	592.4	589.7	590.0	590.4	590.9
Precip (inches)	1.43	2.1	3.04	3.56	1.94	2.86	4.14	4.85	2.28	3.35	4.85	5.68	2.64	3.89	5.62	6.59	3.04	4.47	6.46	7.58

5.4 Rate Control

Table 2 shows that the existing peak flow rate to the Albany Avenue sewer for any storm is 16.8 cfs, while the peak flow rate to the Whipple Street sewer to the east is 1.1 cfs. Under proposed conditions there is no direct flow to either of these sewers because connections to those sewers will be abandoned in lieu of a connection to Outfall #178. The peak flow rate to Outfall #178 for any storm from the project site under proposed conditions is 10.1 cfs (Table 8).

Under existing conditions 16.8 cfs from the site would flow to the Albany diversion structure diversion structure under peak flow conditions. Changing the flow to downstream of the tide gate on Outfall #178 reduces flow at the Albany diversion structure, reduces flow at the tide gate diversion structure, and reduces flow going through the tide gate. The peak flow for the 100-year storm going to Outfall #178 under proposed conditions is also only 60% of the flow leaving the site through the Monarch parcel under existing conditions. Proposed conditions will also result in less ponding area as compared with existing conditions (Attachment 4). Porous pavement drains within 48 hours. Ponding draws down in less than 72 hours.

Ponding depths include:

- Zero to 2.4 feet between the 2- and 100-year storms for Subarea 1 on Sacramento (south)
- Zero to 2.0 feet between the 2- and 100-year storms for Subarea 2 on Sacramento (north)
- Zero on Monarch (never surcharges within eight inches of catch basin because of porous pavement underdrains); if Monarch does not have porous pavement installed, the estimated ponding depth is 1.0 feet
- 0.1 feet to 1.4 feet between the 2- and 100-year storms for Sacramento side slope SS1, with a minimum 0.1 feet of freeboard
- 0.1 feet to 0.6 feet between the 2- and 100-year storms for Sacramento side slope SS4, with a minimum 0.4 feet of freeboard
- Zero to 0.4 feet between the 2- and 100-year storms for Sacramento side slope SS7, with a minimum 0.6 feet of freeboard.

The Sacramento side slope area SS1 has been designed to have a larger cross-sectional area than the other side slope areas. Details of the side slope swales and other design aspects can be seen on the drawings in Attachment 4.

5.5 Volume Control

The project site is exempt from infiltration requirements as it is a contaminated former industrial site. (See 4.1.2 Infiltration Exception of DWM Regulations for Sewer Construction and Stormwater Management).

However, the project plan with the end use as a park will still provide volume control by reducing the impervious area by more than 15%. The proposed Sacramento parcel conditions will have no impervious area. Soil and grass will be placed on the Sacramento parcel, where compacted gravel currently exists. The project plan has included the potential

for some volume control by planning for the possibility of porous pavement being utilized on the Monarch parcel.

5.6 Stormwater Quality

Stormwater quality benefits achieved by this project include:

- Replacement of existing compacted gravel surface with grassy surface
- Filtration of stormwater by porous pavement on the Monarch parcel (the Parks Department may install porous pavement in the future)
- All stormwater will flow to a grassed swale or treatment wetland in the Collateral Channel

Currently, MWRDGC (Joe Schuessler) is working with The Wetland Initiative (TWI - Jill Kostel) to implement a constructed wetland (approximately 1 acre) in the northern portion of the Collateral Channel. We have been in contact with both Joe Schuessler and Jill Kostel about our project and are in agreement, in principle, on sending the stormwater to the treatment wetland. The city of Chicago Department of Water Management (DWM) has also been contacted regarding the project.

6.0 Construction Plans

6.1 Construction Details and Standards

Standard DWM details have been used for sewers and manholes as shown in the attached drawings (Attachment 4) with several exceptions as follows:

- For very shallow cover or deep pipe cover where the clay pipe properties are not strong enough for the loads, Illinois Department of Transportation (IDOT) recommendations for reinforced concrete pipe were used.
- For sewer runs with depths greater than 10 feet, reinforced concrete pipe was used instead of clay pipe following IDOT recommendations.
- Half-traps were originally excluded in the original design because the connection is not to the combined sewer system because the stormsewer connects downstream of the CSO tide gate which flows to the Collateral channel. However, half-traps were added back in (see Modification #1 in Attachment 4) to minimize clogging of the restrictors.
- Drop manholes were not used in the original design because the new connection to the wetland does not contain any sanitary flow enabling easy maintenance during dry weather conditions and the drop is relatively low at between two and three feet. However, a pre-cast concrete drop manhole has been added back in for Manhole 1 and the drops at Manhole 3 have been lowered to be less than 2 feet by adjusting pipe slopes. See Modification #1 in Attachment 4.
- The outfall to the CSO pipe has standing water making a drop manhole to minimize scour unnecessary.

- The separation between the new stormsewer and the existing CSO outfall pipe is less than 18 inches (approximately 75 feet upstream of Manhole 1), however the stormsewer pipe has been designed to be as high as possible in order to maximize the separation between pipes by using minimum pipe slopes and minimizing drops at manholes.

The pavement on the Monarch parcel will be implemented by the Parks Department. The area has been designed so that permeable pavement could be installed by providing 24 inches of IDOT CA-1 specification aggregate. Underdrains to draw down the water are also provided in advance of the pavement that will be placed on the Monarch parcel. Should the Parks department choose to place impervious pavement on the site, ponding would occur greater than 10 inches on the Monarch parcel.

6.2 Sediment and Erosion Control Plan

A sediment and erosion control plan, in the form of a stormwater pollution prevention plan (SWPPP), is required by the State of Illinois because the site disturbs more then 1 acre. The plan showing the location of sediment and erosion control best management practices (BMPs) is provided here as Attachment 5. Areas to be vegetated are shown in the details.

The project will comply with all NPDES requirements for construction activities and a copy of the SWPPP, Notice of Intent (NOI), and permit will be kept on site during construction and made available upon request from DOE or DWM personnel.

6.3 Operation and Maintenance Plan

The operation and maintenance plan (O&M Plan) for the site is described. There are no structures on the property; consequently, the plan cannot be kept on-site after construction activities are completed. During construction, the plan will be kept at the construction manager's office.

Contact Information

During the construction phase, the contact information will be different from the post-construction phase.

Construction Phase Contact Information:
Alan Jones
CH2M HILL
135 South 84th Street, Suite 325
Milwaukee, WI 53214
(414) 272-2426

Post-Construction Phase Contact Information:
While not the property owner, Honeywell is responsible for the construction at the site. Consequently, Honeywell will inform the owners of the O&M responsibilities. Current property owner contacts are as follows:

- Rich Urso, Sacramento parcel
- Samuel Palumbo, Monarch parcel

Future contact is expected to be:

- Bob Foster, Chicago Parks Department

Site Map

The site map is provided in Attachment 1 with expected ponding depths shown in Attachment 4.

Operations and Maintenance Practices

The site has been developed to be low maintenance by using vegetative practices and porous pavement that reduce peak runoff rates. In addition, there is no sidewalk or driveway pavement on the site. Any problems, such as inlet clogging, that could reduce system capacity do not put any structures or infrastructure at risk because of the large ponding area available for the large drainage basins on the Sacramento and Monarch parcels.

Consequently, an O&M Plan that takes into account these factors has been developed. The O&M Plan, to be implemented by the property owner(s), includes:

- The O&M Plan procedures and practices will be reviewed and assessed annually.
- There are no roadways or sidewalks on the site to be maintained.
- The drainage catch basins and flow restrictors will be inspected and cleaned if drainage problems are reported.
- There are no volume control BMPs on-site. Consequently, no inspection is needed for volume control BMPs.
- The owner shall keep an updated log book documenting the performance of the required O&M Plan activities for perpetuity. Log books will be produced upon request by the City inspector.
- Vegetation shall be regularly maintained.
- Should insects or rodent populations reach nuisance levels, control measures will be implemented.
- Because the only infrastructure is inlets and stormsewers, no signage or fencing is planned for the stormwater system.
- Underground vaults (manholes and catch basins) are designed to facilitate cleaning and maintenance. Confined space safety procedures must be followed when entering.

Employee Training

New employees responsible for maintenance will be informed of the O&M Plan procedures and requirements. General guidance relevant to the site inspections and maintenance will be provided.

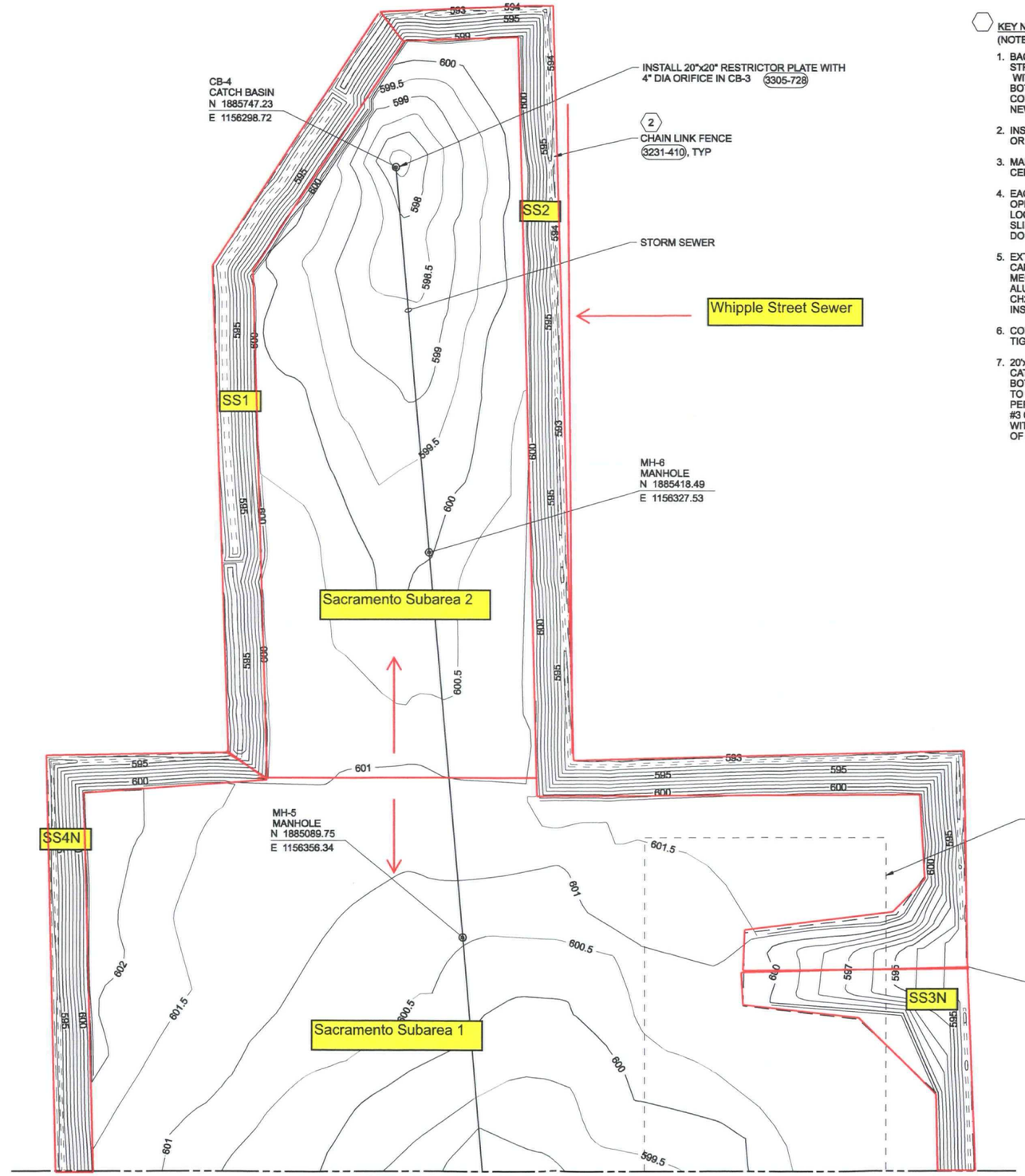
Operation and Maintenance Plan Modifications

Proposed modification to the O&M Plan must be submitted to the DWM-Sewer Design Section for review and approval. The existing and proposed O&M Plans and a copy of the original DWM approval letter are required for the modification and must be submitted simultaneously with the proposed amendments.

Other Submittals and Requirements

A copy of final as-built plans will be submitted to the Department of Water Management sewer inspector for approval within 14 days after completion of construction.

Attachment 1 – Site Map



KEY NOTES:
(NOTES APPLY TO DWGS C-7 AND C-8)

1. BACKFILL MANHOLES, CATCH BASINS AND OTHER STRUCTURES WITH A STORM SEWER CONNECTION WITH CONTROLLED LOW STRENGTH FILL FROM BOTTOM OF EXCAVATION TO TOP OF PIPE BETWEEN CONNECTION AND FIVE FEET FROM CONNECTION ALONG NEW PIPE.
2. INSTALL PERIMETER FENCE WITHIN 6 INCHES OF PROPERTY LINE, OR EXISTING FENCE AS DIRECTED BY CH2M HILL.
3. MANHOLE AND CATCH BASIN COORDINATES ARE TO THE CENTER OF THE STRUCTURE.
4. EACH GATE SHALL HAVE A 30 FOOT OPENING FOR A TOTAL OPENING OF 60 FEET. CENTER GATES AT EXISTING GATE LOCATION. ONE GATE SHALL SLIDE NORTH, ONE GATE SHALL SLIDE SOUTH. GATES SHALL LATCH TOGETHER AT MIDDLE. DO NOT PROVIDE A CENTER POST FOR CATCH.
5. EXTEND PIPE NORTH FROM MANHOLE MINIMUM OF 20 FEET. CAP PIPE WITH CH2M HILL APPROVED WATER TIGHT MECHANICAL SEAL. SEAL SHALL BE IRON GRIP OR T-HANDLE ALUMINUM GRIPPER FROM CHERNE INDUSTRIES, OR CH2M HILL APPROVED EQUAL. PROTECT PIPE DURING INSTALLATION.
6. CONNECT TO EXISTING STORM SEWER WITH A WATER TIGHT CONNECTION. (3305-730)
7. 20'x20' PERFORATED PIPE UNDERDRAIN CENTER AT CATCH BASIN. INSTALL ON TOP OF GEOTEXTILE FABRIC, ON BOTTOM OF AGGREGATE BASE. CONNECT PERFORATED PIPE TO CATCH BASIN WITH 4 CONNECTIONS, AS SHOWN. PERFORATED PIPE IS NOT NEEDED FOR ALTERNATE BID ITEMS #3 OR #4. PIPE SHALL BE 6" HDPE, SDR 17, ASTM D 3350-02, WITH 4 0.5 INCH HOLES EQUALLY SPACED AROUND PERIMTER OF PIPE AT 4 INCH CENTERS ALONG THE LENGTH OF IPIE.

NO.	DATE	REVISION	BY	APVD
DSGN	BA BROWN	DR MA GERIK	CHK	APVD

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CH2MHILL

CIVIL
SITE PLAN
NORTH

ISSUED FOR 90% REVIEW

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	327757
DWG	C-7
SHEET	

FILENAME: dn05c007_327757.dgn PLOT DATE: 6/18/2008 PLOT TIME: 12:54:48 PM

MATCH LINE SEE DRAWING C-7

STORM SEWER

MH-4
MANHOLE
N 1884761.01
E 1156385.15

CB-7
CATCH BASIN
N 1884622.82
E 1156023.05

CB-6
CATCH BASIN
N 1884628.74
E 1156207.61

SS4S

SS3S

5 CAP PIPE FOR END OF PHASE 1

SS5

MH-3
MANHOLE
N 1884530.41
E 1156405.36

CB-2
CATCH BASIN
N 1884530.38
E 1156415.36

Sacramento Subarea 1

Albany Avenue Sewer

CB-1
CATCH BASIN (3305-714)
N 1884306.12 (3305-715)
E 1156316.88

MH-2
MANHOLE
N 1884306.15
E 1156306.88

7 Monarch Site

SS6

SS8

20' OPENING
CANTILEVER SLIDE GATE (3231-425)
CENTER AT
N 1884171.50
E 1156215.88

20' OPENING
CANTILEVER SLIDE GATE (3231-425)
CENTER AT
N 1884031.72
E 1156220.82

MH-1A
MANHOLE
N 1884105.13
E 1156274.00

SS7

Route to connect with CSO Outfall #178.

MH-1
MANHOLE
N 1884001.20
E 1156257.00

INSTALL 20"x20" RESTRICTOR PLATE WITH 8" DIA ORIFICE IN CB-2 (3305-728)

INSTALL 20"x20" RESTRICTOR PLATE WITH 8" DIA ORIFICE IN CB-1 (3305-728)

CB-5
CA
N
E

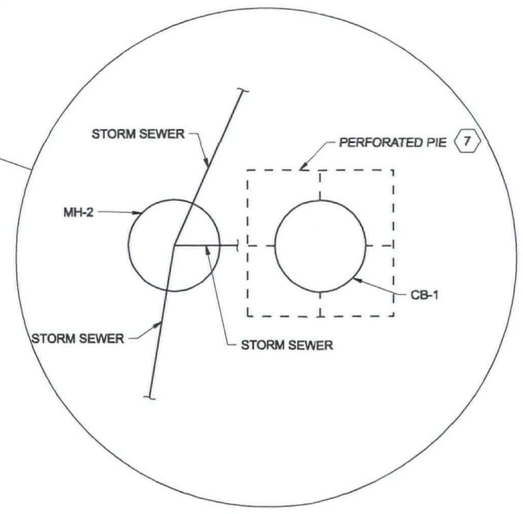
Tide gate isolates collateral channel from upstream sewers.

2 CHAIN LINK FENCE (3231-410), TYP

6

3123-115

Outfall #178 to Collateral Channel



DRAWING NOTE:
1. REFER TO DRAWING C-7 FOR SITE PLAN KEY NOTES.

ALTERNATE BID ITEM #2:
PROPOSED PLACEMENT OF CA-1 AGGREGATE. PLACEMENT OF CA-1 IS PROPOSED AS AN ALTERNATIVE TO THE EARTH FILL WITH TOPSOIL OR GRANULAR FILL COVER MATERIALS. LOCATION OF CA-1 IS SUBJECT TO CHANGE.

N

0 50 100 150
Scale In Feet

NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
		BA BROWN	MA GERIK				

REVISION

ISSUED FOR 90% REVIEW

CH2MHILL

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CIVIL
SITE PLAN
SOUTH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	327757
DWG	C-8
SHEET	

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Attachment 2 - Design Plan Drawings

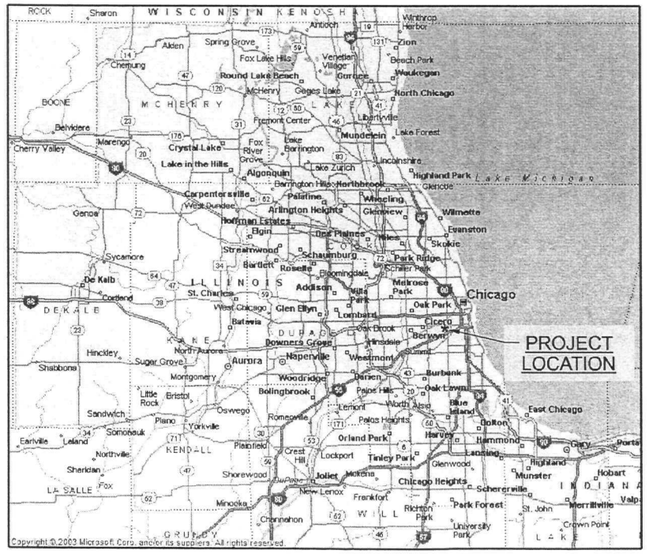
Three original signed copies of the design plan drawings were included in the original application to the City of Chicago Building Department. One copy of those drawings is included here.

HONEYWELL CELOTEX MAIN SITE COVER CONSTRUCTION
CHICAGO, ILLINOIS
FINAL DESIGN
(JUNE 27, 2008)

I HEARBY CERTIFY THAT THESE PLANS WERE PREPARED BY ME AND TO THE BEST OF MY PROFFESIONAL KNOWLEDGE COMPLY WITH THE CHICAGO BUILDING CODE:

ROGER A. YOLO
REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS
Expires 11-30-2009
6/11/08

INDEX OF DRAWINGS



AREA MAP
NTS

VICINITY MAP
NTS

LOCATION MAP
NTS

NO.	DATE	DSGN	CHK	APVD	BY
2	08/07/08	TW GHYLIN	MA GERIK	AR JONES	JCH
1	06/27/08	DR		APVD	MAG

REVISION

CONFORMED FOR CONSTRUCTION
ADDENDUM NO. 1

RAY
RAY
RA YOLO

ROGER A. YOLO
REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS
Expires 11-30-08

ISSUED FOR 90% REVIEW

CH2MHILL

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS

HONEYWELL INTERNATIONAL INC

GENERAL
TITLE SHEET, INDEX OF DRAWINGS AND AREA/VICINITY/LOCATION MAPS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

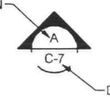
DATE	JUNE 2008
PROJ	327757
DWG	G-1
SHEET	1

CIVIL LEGEND

EXISTING	THIS CONTRACT	
		STORM DRAIN
	10+00	PIPELINE WITH STATIONING
		VALVE
	1" CARV	COMBINATION AIR RELEASE VALVE WITH SIZE
	MH	MANHOLE
		PROPERTY AND/OR RIGHT-OF-WAY LINE
		CENTERLINE
		DRAINAGE WAY OR DITCH
	702	CONTROL POINT
	370	CONTOUR
	340	SPOT ELEVATION
		FINISH GRADE ELEVATION
		SOIL BORING
		CHAIN LINK FENCE LINE
		SILT FENCE
		BLIND FLANGE, CAP OR PLUG
	M	METER
	12" CMP	CULVERT WITH SIZE AND TYPE
	SD	STORM DRAIN CATCH BASIN
SSFM		SANITARY SEWER FORCE MAIN
2" G		GAS PIPELINE
OHP&T		OVERHEAD POWER AND TELEPHONE
T		UNDERGROUND TELEPHONE
OHT		OVERHEAD TELEPHONE
TV		UNDERGROUND TELEVISION CABLE
FO		UNDERGROUND FIBER OPTIC CABLE
		UTILITY POLE/POWER POLE
		FIRE HYDRANT
		POLE GUY WIRE
		LUMINAIRE
		SANITARY SEWER CLEANOUT
		SIGN
	OR	TREE (SIZE & SPECIES IF KNOWN)
		TREE TO BE REMOVED
		CONSTRUCTION ENTRANCE
	OR OR	DEMOLITION

DETAIL AND SECTION DESIGNATION

SECTION OR PHOTO (LETTER) OR DETAIL (NUMERAL) DESIGNATION
WHERE TAKEN



DRAWING NUMBER WHERE SHOWN

SECTION OR PHOTO (LETTER) OR DETAIL (NUMERAL) DESIGNATION
WHERE SHOWN

STANDARD DETAIL DESIGNATION

STANDARD DETAIL NUMBER CALLED OUT ON DRAWING

ABBREVIATIONS

@	AT
AVE	AVENUE
BOT	BOTTOM
CIP	CAST IRON PIPE
CMP	CORRUGATED METAL PIPE
CL	CENTERLINE
CONC	CONCRETE
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DND	DO NOT DISTURB
DR	DRIVE OR DIMENSION RATIO
E	EAST
EL	ELEVATION
ESVCP	EXTRA STRENGTH VITRIFIED CLAY PIPE
EXST	EXISTING
EW	EACH WAY
FM	FORCE MAIN
FO	FIBER OPTIC
G	GAS
GM	GRAVITY MAIN
HDPE	HIGH DENSITY POLYETHYLENE
HORIZ	HORIZONTAL
INV	INVERT
IP	IRON POST
LT	LEFT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
N	NORTH
NCP	NON REINFORCED CONCRETE PIPE
NO	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OHP	OVERHEAD POWER
PE	PERMANENT EASEMENT
PL	PROPERTY LINE
PP	POWER POLE
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
REQD	REQUIRED
RJ	RESTRAINED JOINT
RT	RIGHT
RR	RAILROAD
R/W	RIGHT OF WAY
S	SOUTH
SD	STORM DRAIN
SDR	STANDARD DIMENSION RATIO
SN	SEWER MANHOLE NUMBER
SPECD	SPECIFIED
SS	SANITARY SEWER
SST	STAINLESS STEEL
STA	STATION
TBR&R	TO BE REMOVED AND REPLACED
T, TEL	TELEPHONE
TE	TEMPORARY EASEMENT
TV	TELEVISION
TYP	TYPICAL
UGP	UNDERGROUND POWER
VERT	VERTICAL
W	WATER, WEST
W/	WITH
WT	WEIGHT

GENERAL SITE NOTES:

1. SOURCE OF TOPOGRAPHY SHOWN ON THE CIVIL PLANS ARE BASE MAPS PROVIDED BY BOLLINGER, LACH AND ASSOCIATES, INC. ADDITIONAL MAPPING HAS BEEN ADDED FROM AS-BUILT DATA. EXISTING CONDITIONS MAY VARY FROM THOSE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND ADJUST WORK PLAN ACCORDINGLY PRIOR TO BEGINNING CONSTRUCTION.
2. EXISTING TOPOGRAPHY, STRUCTURES, AND SITE FEATURES ARE SHOWN SCREENED AND/OR LIGHT-LINED. NEW FINISH GRADE, STRUCTURES, AND SITE FEATURES ARE SHOWN HEAVY-LINED.
3. HORIZONTAL DATUM: NAD 83.
4. VERTICAL DATUM: NAVD 88.
5. STAGING AREA SHALL BE FOR CONTRACTOR'S EMPLOYEE PARKING, CONTRACTOR'S TRAILERS AND ON-SITE STORAGE OF MATERIALS.
6. PROVIDE TEMPORARY FENCING AS NECESSARY TO MAINTAIN SECURITY AT ALL TIMES.
7. ELEVATIONS GIVEN ARE TO FINISH GRADE UNLESS OTHERWISE SHOWN.
8. SLOPE UNIFORMLY BETWEEN CONTOURS AND SPOT ELEVATIONS SHOWN.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION CONTROL DEVICES DURING CONSTRUCTION.

GENERAL YARD PIPING AND UTILITIES NOTE:

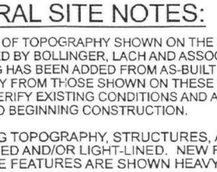
1. ALL PIPES SHALL HAVE A CONSTANT SLOPE BETWEEN INVERT ELEVATIONS UNLESS A FITTING IS SHOWN.

GENERAL NOTES

1. PIPELINE STATIONING AND LENGTHS OF PIPE INDICATED ARE BASED ON HORIZONTAL PROJECTION OF THE PIPE CENTERLINE.
2. INDICATED SCALES ARE BASED ON FULL-SIZE DRAWINGS, AND IF DRAWINGS ARE REDUCED, SCALES MUST BE ADJUSTED ACCORDINGLY.
3. GEOTECHNICAL INFORMATION AND BORING LOGS ARE AS INDICATED.
4. EXISTING UTILITIES ARE SHOWN ON THESE PLANS FOR CONVENIENCE OF THE CONTRACTOR. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITY PIPE AND/OR STRUCTURES, AS SHOWN, ARE BASED ON INFORMATION OBTAINED FROM AVAILABLE AGENCY STANDARDS. TAKE PRECAUTIONARY MEASURES TO PROTECT UTILITY LINES AND STRUCTURES SHOWN AS WELL AS ANY AND ALL OTHERS NOT OF RECORD OR NOT SHOWN ON THESE PLANS. EXISTING UTILITY SERVICE LATERALS ARE TYPICALLY NOT SHOWN ON THESE PLANS UNLESS OTHERWISE INDICATED.
5. VERIFY THE ACTUAL LOCATION, ELEVATION AND CONDITION OF POINTS OF CONNECTION TO EXISTING FACILITIES AND PROVIDE NOTICE OF ANY DISCREPANCIES AS INDICATED.
6. PRESERVE ALL SURVEY MARKERS AND MONUMENTATION WHEREVER POSSIBLE. RE-ESTABLISH THOSE REQUIRING REMOVAL IN ACCORDANCE WITH THE LOCAL GOVERNING AUTHORITY.
7. LIMIT CONSTRUCTION OPERATIONS TO WITHIN THE RIGHT-OF-WAY, EASEMENTS AND ANY OTHER DESIGNATED WORK AREAS AS INDICATED. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ANY DAMAGES AS A RESULT OF CONSTRUCTION ACTIVITIES OUTSIDE OF RIGHT-OF-WAYS, EASEMENTS AND ANY OTHER DESIGNATED WORK AREAS SHOWN ON THE DRAWINGS.
8. RESTORE ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES AS INDICATED. TOPSOIL AREAS ARE TO BE VEGETATED WITH GRASS.
9. ALL SPECIFICATIONS, DRAWINGS, AND DETAILS INCLUDED IN THE CONTRACT DOCUMENTS SHALL FULLY APPLY TO THE WORK WHETHER SPECIFICALLY REFERENCED OR NOT.
10. LAY PIPE TO CONTINUOUS UPWARD OR DOWNWARD SLOPE BETWEEN INDICATED ELEVATION POINTS WHILE MAINTAINING MINIMUM CLEARANCE WITH EXISTING UTILITIES.

GENERAL NOTE

1. THIS IS A STANDARD LEGEND SHEET. THEREFORE, NOT ALL OF THE INFORMATION SHOWN MAY BE USED ON THIS PROJECT.



Expires 11/30/09

NO.	DATE	DSGN	DR	CHK	APVD
2	08/07/08	TW GHYLIN	MA GERIK	AR JONES	RA YOLO
1	06/27/08		REVISION		APVD
					BY
					MAG
					JCH
					RAY
					RAY

CONFORMED FOR CONSTRUCTION
ADDENDUM NO. 1

ISSUED FOR 90% REVIEW

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CH2MHILL

GENERAL
CIVIL AND DESIGNATION LEGENDS, ABBREVIATIONS AND GENERAL NOTES

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 20008
PROJ	327757
DWG	G-2
SHEET	2

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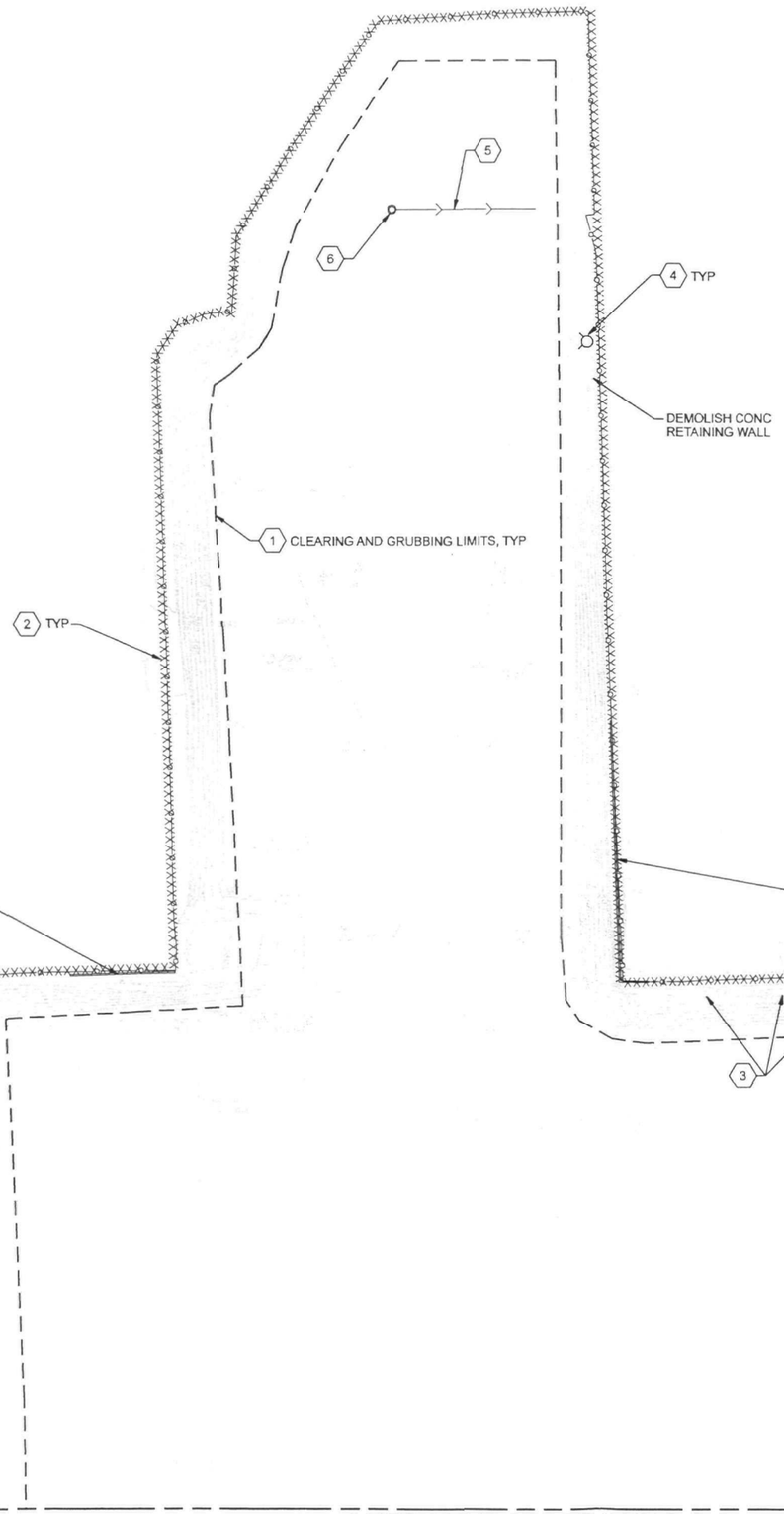


MATCH LINE SEE DRAWING C-2

SITE DEMOLITION KEY NOTES:
(NOTES APPLY TO DWGS C-1 AND C-2)

1. CLEAR AND GRUB BETWEEN PROPERTY LINE AND TOP OF SLOPE. REMOVE TREES AND SHRUBS BETWEEN THE PROPERTY LINE AND THE CLEARING AND GRUBBING LIMITS, EXCEPT WHERE NOTED BY CH2M HILL DURING PRECONSTRUCTION MEETING. PROTECT TREES TO REMAIN WITH 4 FT SECURITY FENCE AROUND PERIMETER OF TREE. FENCE SHALL BE LOCATED NO CLOSER THAN THE DRIP LINE.
2. REMOVE CHAIN LINK FENCE AND GATES.
3. REMOVE ABANDONED UTILITY POLES WITHIN PROPERTY LIMITS.
4. FIRE HYDRANTS SHALL REMAIN PROTECTED, ACCESSIBLE AND CLEARLY VISIBLE AT ALL TIMES.
5. ABANDON EXISTING STORM SEWER PIPE IN PLACE.
6. REMOVE TOP SECTION OF THE MANHOLE. ABANDON STRUCTURE IN PLACE BY DEWATERING, REMOVING ACCUMULATED SEDIMENT AND FILLING MANHOLE WITH CONTROLLED LOW STRENGTH FILL TO THE TOP OF THE PIPE. BACKFILL REMAINDER OF MANHOLE WITH TRENCH BACKFILL. THE TOP OF ABANDONED STRUCTURE SHALL BE 2 FEET (MINIMUM) BELOW EXISTING GRADE.
7. CALL CHICAGO UTILITY ALERT NETWORK (DIGGER) 312-744-7000 TO LOCATE UTILITIES A MINIMUM OF 48 HOURS PRIOR TO DISTURBING SITE.

N

0 50 100 150
Scale In Feet

ROGER A. YOLO
062-040812
REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS
Expires 11/30/2009

NO.	DATE	DSGN	DR	CHK	APVD	BY
2	08/07/08	BA BROWN	MA REICHERT	AR JONES	RA YOLO	JCH RAY
1	06/27/08					MAG RAY

CONFORMED FOR CONSTRUCTION
ADDENDUM NO. 1
REVISION

CH2MHILL

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CIVIL
DEMOLITION PLAN
NORTH

ISSUED FOR 90% REVIEW

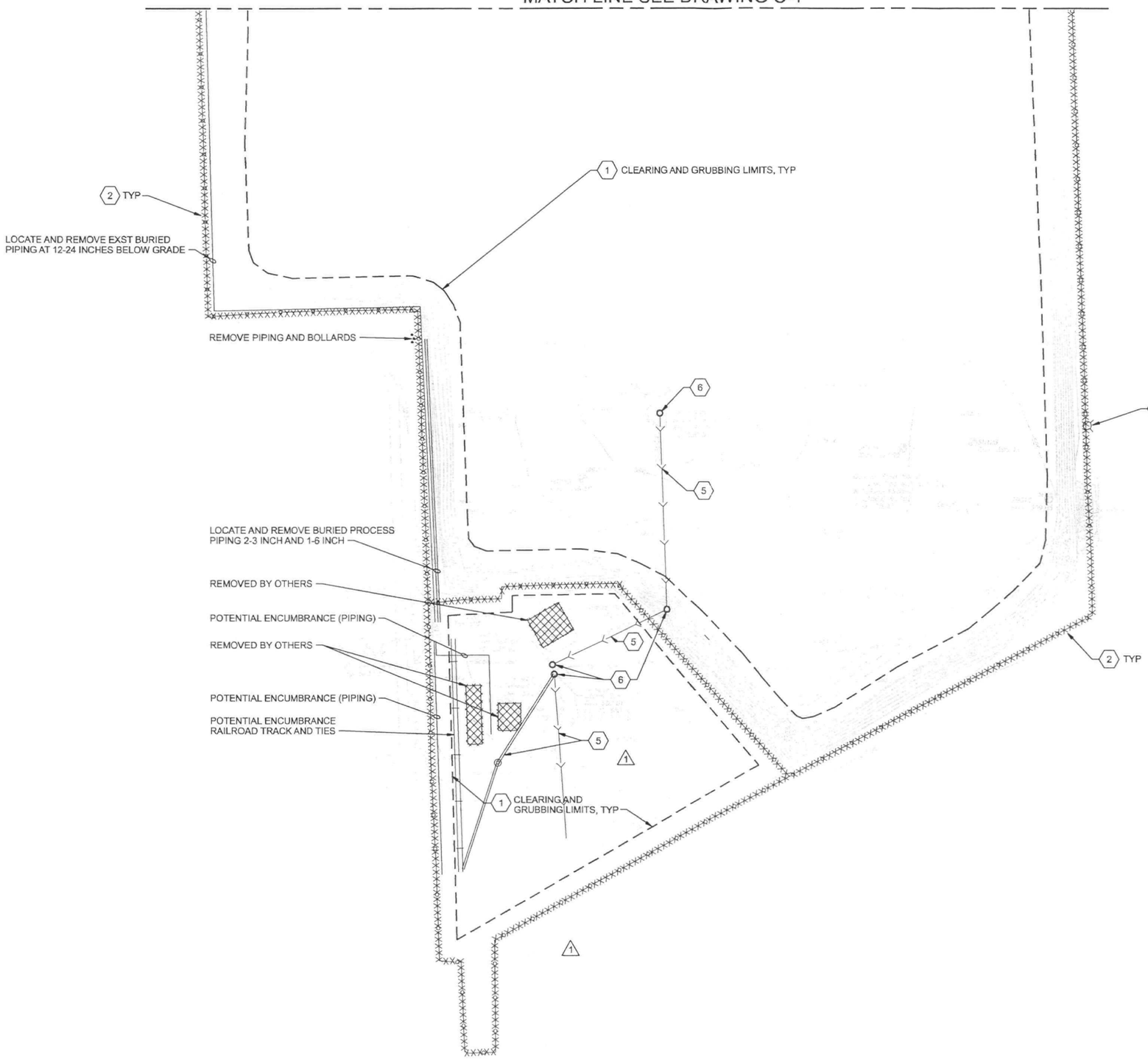
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	327757
DWG	C-1
SHEET	3

FILENAME: dn05c001_327757.dgn PLOT DATE: 8/7/2008 PLOT TIME: 10:44:11 AM

MATCH LINE SEE DRAWING C-1

DRAWING NOTE:
1. REFER TO DRAWING C-1 FOR DEMOLITION PLAN KEY NOTES.



N

0 50 100 150
Scale In Feet

ROGER A. YOLO
062-047787
REGISTERED PROFESSIONAL ENGINEER
OF
ILLINOIS
Expires 11/30/09

NO.	DATE	DSGN	DR	CHK	REVISION	BY	APVD
2	08/07/08	BA BROWN	MA REICHERT	AR JONES	CONFORMED FOR CONSTRUCTION ADDENDUM NO. 1	JCH MAG	RAY RAY
1	06/27/08						RA YOLO

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CH2MHILL

CIVIL
DEMOLITION PLAN
SOUTH

ISSUED FOR 90% REVIEW

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	327757
DWG	C-2
SHEET	4

FILENAME: dn05c002_327757.dgn PLOT DATE: 8/7/2008 PLOT TIME: 10:46:27 AM

ORIGINATING BENCHMARKS & SITE BENCHMARKS

ME 1801 CHISELED SQUARE (MARKED BY THE LETTERS B.M.) AT THE TOP OF THE NORTHWEST CORNER OF THE SOUTHEAST STONE ABUTMENT OF THE ILLINOIS CENTRAL RAILROAD BRIDGE NO. W6-5 OVER THE CHICAGO DRAINAGE CANAL, ABOUT 300 YARDS EAST OF THE SOUTH END OF THE SOUTH KEDZIE BRIDGE OVER THE CANAL.
ELEV. 602.47 (NAVD 88)

ME 1797 (OFFSET) CHISELED SQUARE IN TOP OF CONCRETE WALL AT THE SOUTHWEST CORNER OF KEDZIE AND PERSHING.
ELEV. 598.57 (NAVD 88)

FOR SITE BENCHMARKS USE THE THREE CONTROL POINTS ON THE SACRAMENTO SITE SHOWN ON THE DRAWINGS.

CONTROL POINT No. 1
SET IRON ROD WITH BLA CAP
N 1,885,119.1310
E 1,156,605.9973
ELEV 600.18

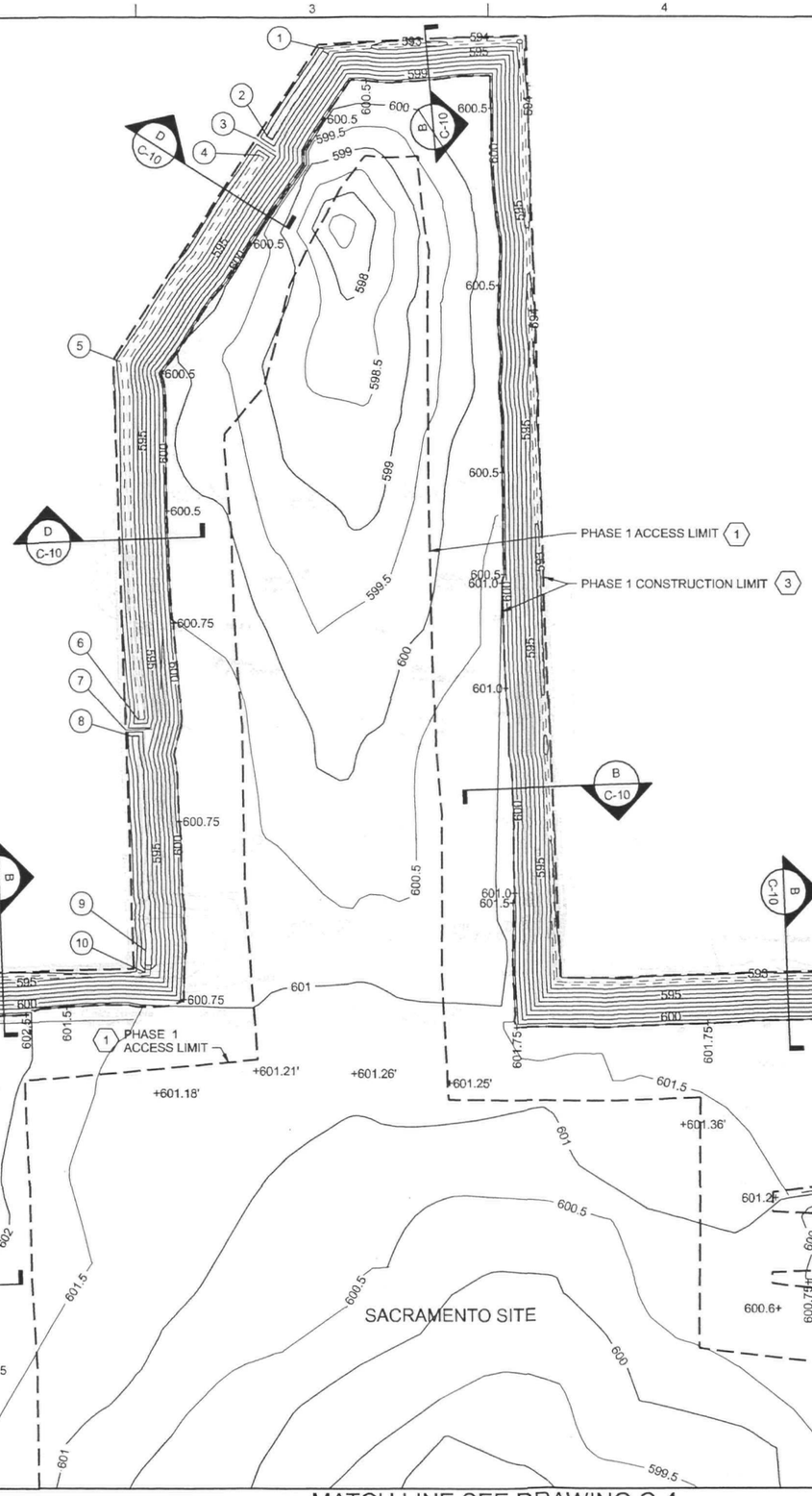
CONTROL POINT No. 2
SET IRON ROD WITH BLA CAP
N 1,884,443.6643
E 1,156,648.9109
ELEV 598.03

CONTROL POINT No. 3
SET IRON ROD WITH BLA CAP
N 1,885,133.7560
E 1,156,294.4689
ELEV 599.95

HORIZONTAL DATUM IS NAD 83 WAS DERIVED FROM STATIC GPS OBSERVATIONS ON CONTROL POINTS 2 AND 3 UTILIZING SINGLE POINT OPUS SOLUTIONS.

LOCATION OF WEST BOTTOM OF SWALE

	NORTHING	EASTING	ELEVATION
1	N 1885876.30	E 1156290.73	593.61
2	N 1885816.24	E 1156251.16	592.88
3	N 1885814.38	E 1156243.34	594.84
4	N 1885803.18	E 1156245.49	592.13
5	N 1885662.24	E 1156147.68	592.13
6	N 1885416.78	E 1156159.22	592.13
7	N 1885409.64	E 1156150.54	594.42
8	N 1885405.31	E 1156155.23	592.93
9	N 1885258.77	E 1156164.06	592.93
10	N 1885243.99	E 1156163.15	594.71



CONFORMED FOR CONSTRUCTION
ADDENDUM NO. 1

NO.	DATE	DSGN	DR	CHK	APVD	REVISION
2	08/07/08	TW GHYLIN	MA GERIK	AR JONES	RA YOLO	
1	06/27/08	JCH	RAY	RAY		
		MAG				
		BY				

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CH2MHILL

CIVIL
PHASING AND GRADING PLAN
NORTH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	327757
DWG	C-3
SHEET	5

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ISSUED FOR 90% REVIEW

FILENAME: dn05c003_327757.dgn PLOT DATE: 8/7/2008 PLOT TIME: 10:51:46 AM

MATCH LINE SEE DRAWING C-3

SACRAMENTO SITE

MONARCH SITE

PHASE 1 ACCESS LIMIT (1)

PHASE 1 CONSTRUCTION LIMIT

PHASE 1 CONSTRUCTION LIMIT (3)

592.46
N 1884624.36
E 1156054.46

592.68
N 1884626.49
E 1156152.70

592.54
N 1884626.47
E 1156087.26

APPROXIMATE LOCATION OF EXISTING MWRD DIVERSION STRUCTURE

APPROXIMATE LOCATION OF 108" ALBANY AVE SEWER

CONSTRUCTION ENTRANCE (TO REMAIN)

CONSTRUCTION ENTRANCE (TO REMAIN)

PHASE 1 CONSTRUCTION LIMIT

APPROXIMATE LOCATION OF 17" SANITARY SEWER (DND)

APPROXIMATE LOCATION OF 36" STORM SEWER (DND)

APPROXIMATE LOCATION OF EXISTING MWRD TIDE GATE STRUCTURE

APPROXIMATE LOCATION OF 36" STORM SEWER (DND)

APPROXIMATE LOCATION OF 30" SANITARY SEWER (DND)

APPROXIMATE LOCATION OF 36" STORM SEWER (DND)

N

0 50 100 150
Scale In Feet

CONFORMED FOR CONSTRUCTION
ADDENDUM NO. 1

NO.	DATE	REVISION	CHK	APVD
2	08/07/08		AR JONES	RAY
1	06/27/08		MA GERIK	RAY

DSGN	DR	BY	APVD
TW GHYLIN		JCH MAG	RA YOLO

ROGER A. YOLO
REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS
EXPIRES 11/30/08

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CH2MHILL

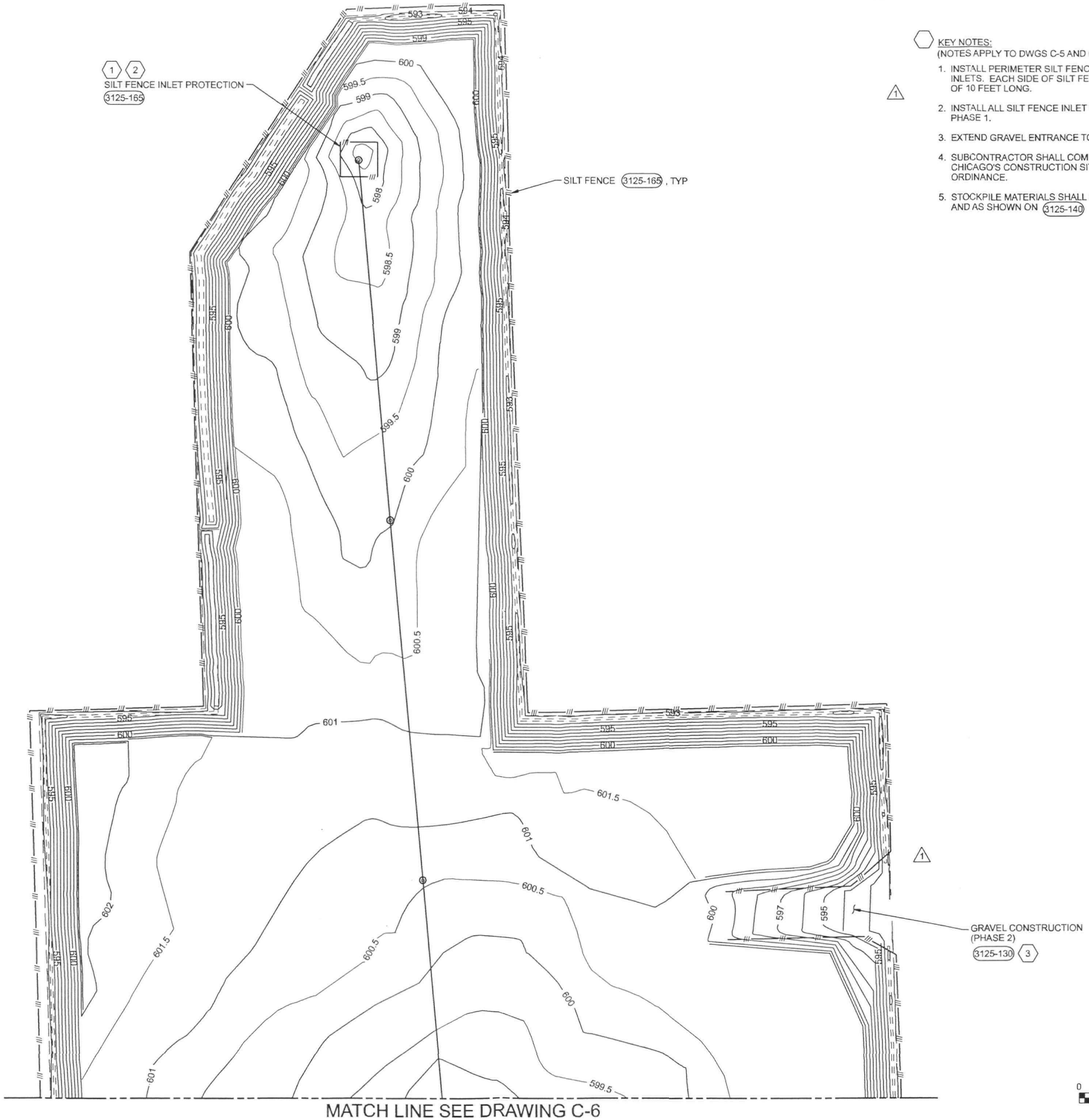
CIVIL
PHASING AND GRADING PLAN
SOUTH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	327757
DWG	C-4
SHEET	6

ISSUED FOR 80% REVIEW

FILENAME: dn05c004_327757.dgn PLOT DATE: 8/7/2008 PLOT TIME: 10:59:40 AM



KEY NOTES:
(NOTES APPLY TO DWGS C-5 AND C-6)

1. INSTALL PERIMETER SILT FENCE AROUND CATCH BASIN INLETS. EACH SIDE OF SILT FENCE SHALL BE A MINIMUM OF 10 FEET LONG.
2. INSTALL ALL SILT FENCE INLET PROTECTION DURING PHASE 1.
3. EXTEND GRAVEL ENTRANCE TO TOP OF SLOPE.
4. SUBCONTRACTOR SHALL COMPLY WITH THE CITY OF CHICAGO'S CONSTRUCTION SITE CLEANLINESS ORDINANCE.
5. STOCKPILE MATERIALS SHALL BE COVERED AS SPECIFIED AND AS SHOWN ON 3125-140

NO.	DATE	REVISION	BY	APVD
2	08/07/08	CONFORMED FOR CONSTRUCTION	JCH	RAY
1	06/27/08	ADDENDUM NO. 1	MAG	RAY

DSGN BA BROWN | DR MA REICHERT | CHK AR JONES | APVD RA YOLO

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CH2MHILL

CIVIL
SEDIMENTATION AND EROSION CONTROL PLAN NORTH

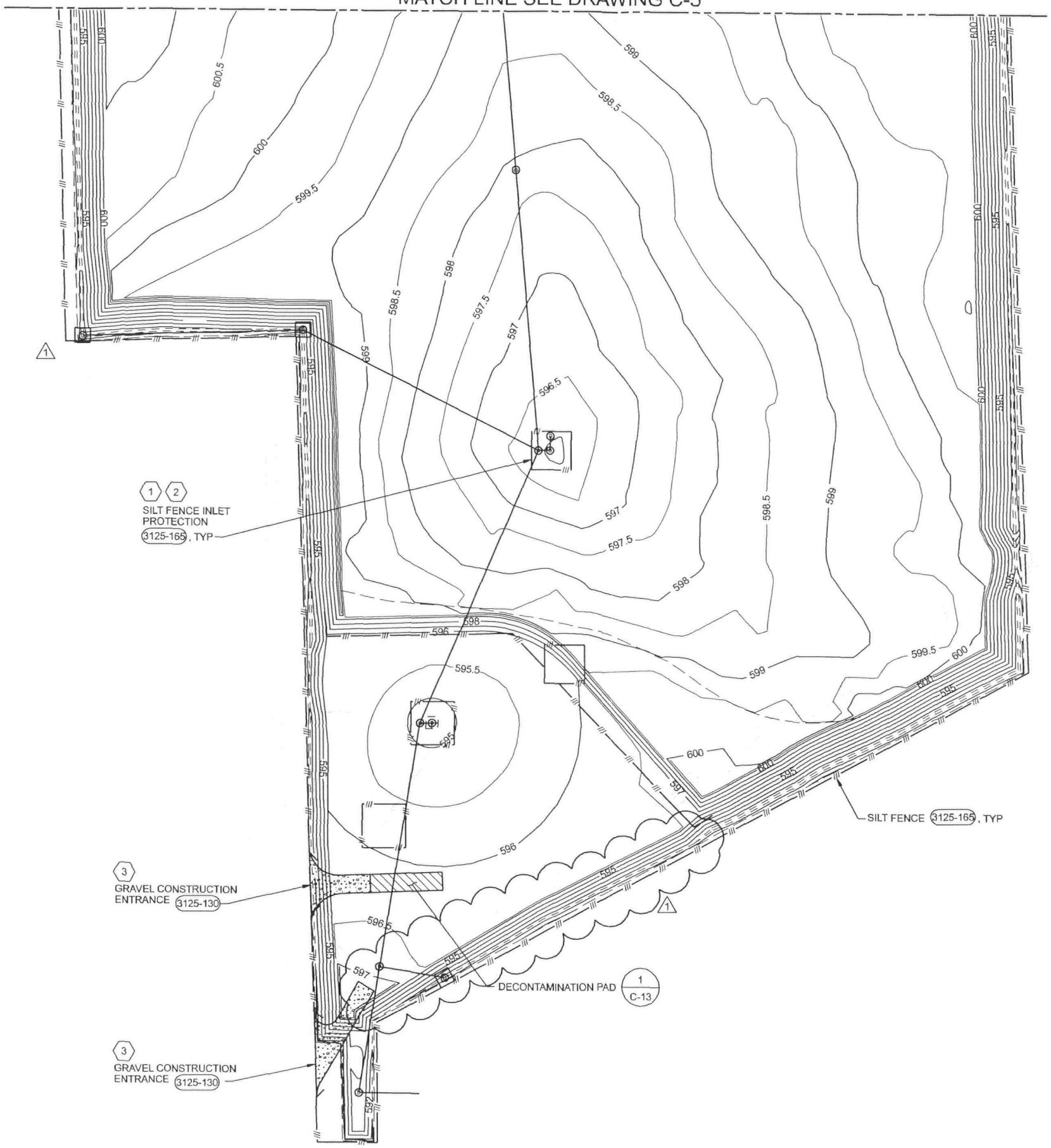
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	327757
DWG	C-5
SHEET	7

ISSUED FOR 90% REVIEW

FILENAME: dn05c005_327757.dgn PLOT DATE: 8/7/2008 PLOT TIME: 11:15:24 AM

MATCH LINE SEE DRAWING C-5



DRAWING NOTE:

1. REFER TO DRAWING C-5 FOR SEDIMENTATION AND EROSION CONTROL KEY NOTES.

N

0 50 100 150
Scale In Feet

ROGER A. YOLO
062-050154
REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS
Expires 11/30/2009

NO.	DATE	DSGN	DR	CHK	APVD	BY
2	08/07/08	BA BROWN	MA REICHERT	AR JONES	RAY	JCH
1	06/27/08				RAY	MAG

CONFORMED FOR CONSTRUCTION
ADDENDUM NO. 1
REVISION

RA YOLO APVD

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CH2MHILL

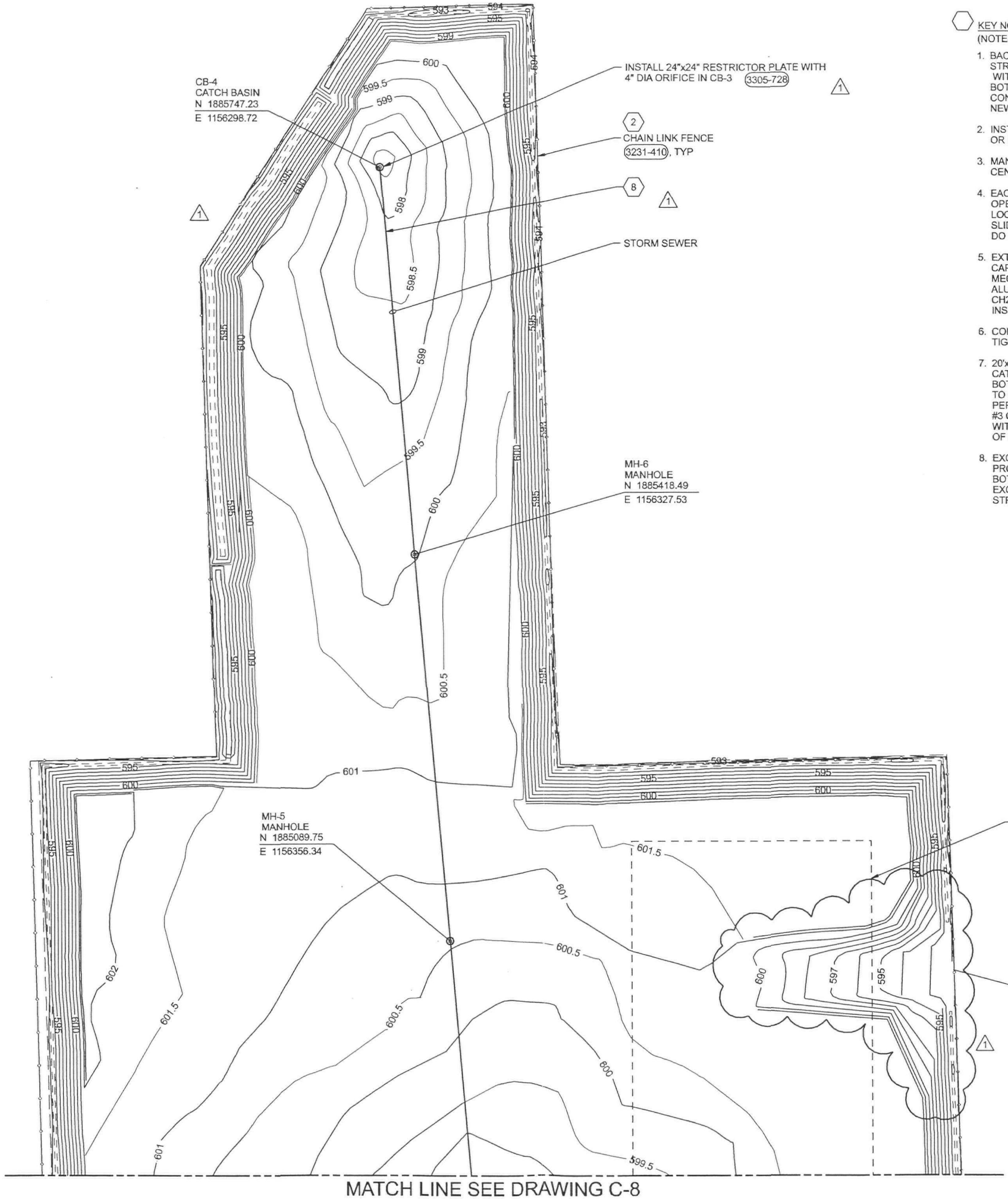
HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CIVIL
SEDIMENTATION AND EROSION CONTROL PLAN SOUTH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	327757
DWG	C-6
SHEET	8

FILENAME: dn05c006_327757.dgn PLOT DATE: 8/7/2008 PLOT TIME: 11:20:27 AM



KEY NOTES:
(NOTES APPLY TO DWGS C-7 AND C-8)

1. BACKFILL MANHOLES, CATCH BASINS AND OTHER STRUCTURES WITH A STORM SEWER CONNECTION WITH CONTROLLED LOW STRENGTH FILL FROM BOTTOM OF EXCAVATION TO TOP OF PIPE BETWEEN CONNECTION AND FIVE FEET FROM CONNECTION ALONG NEW PIPE.
2. INSTALL PERIMETER FENCE WITHIN 6 INCHES OF PROPERTY LINE, OR EXISTING FENCE AS DIRECTED BY CH2M HILL.
3. MANHOLE AND CATCH BASIN COORDINATES ARE TO THE CENTER OF THE STRUCTURE.
4. EACH GATE SHALL HAVE A 16 FOOT OPENING FOR A TOTAL OPENING OF 32 FEET. CENTER GATES AT EXISTING GATE LOCATION. ONE GATE SHALL SLIDE NORTH, ONE GATE SHALL SLIDE SOUTH. GATES SHALL LATCH TOGETHER AT MIDDLE. DO NOT PROVIDE A CENTER POST FOR CATCH.
5. EXTEND PIPE NORTH FROM MANHOLE MINIMUM OF 20 FEET. CAP PIPE WITH CH2M HILL APPROVED WATER TIGHT MECHANICAL SEAL. SEAL SHALL BE IRON GRIP OR T-HANDLE ALUMINUM GRIPPER FROM CHERNE INDUSTRIES, OR CH2M HILL APPROVED EQUAL. PROTECT PIPE DURING INSTALLATION.
6. CONNECT TO EXISTING STORM SEWER WITH A WATER TIGHT CONNECTION. (3305-730)
7. 20'x20' PERFORATED PIPE UNDERDRAIN CENTER AT CATCH BASIN. INSTALL ON TOP OF GEOTEXTILE FABRIC, ON BOTTOM OF AGGREGATE BASE. CONNECT PERFORATED PIPE TO CATCH BASIN WITH 4 CONNECTIONS, AS SHOWN. PERFORATED PIPE IS NOT NEEDED FOR ALTERNATE BID ITEMS #3 OR #4. PIPE SHALL BE 6" HDPE, SDR 17, ASTM D 3350-02, WITH 4 0.5 INCH HOLES EQUALLY SPACED AROUND PERIMTER OF PIPE AT 4 INCH CENTERS ALONG THE LENGTH OF IPIE.
8. EXCAVATE PIPE TRENCH TO A BOTTOM ELEVATION THAT WILL PROVIDE 3.5 FEET BETWEEN THE PROPOSED GRADE AND THE BOTTOM OF THE TRENCH. BACKFILL FROM BOTTOM OF EXCAVATION TO THE TOP OF PIPE WITH CONTROLLED LOW STRENFTH FILL. SEE DWG C-9 AND C-10 FOR LENGTH.

NO.	DATE	REVISION	BY	APVD
2	08/07/08	CONFORMED FOR CONSTRUCTION	JCH	RAY
1	06/27/08	ADDENDUM NO. 1	MAG	RAY

DSGN BA BROWN | DR MA GERIK | CHK AR JONES | APVD RA YOLO

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CH2MHILL

CIVIL
SITE PLAN
NORTH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	327757
DWG	C-7
SHEET	9

ISSUED FOR 90% REVIEW

FILENAME: dn05c007_327757.dgn PLOT DATE: 8/7/2008 PLOT TIME: 11:23:19 AM

MATCH LINE SEE DRAWING C-7

STORM SEWER

MH-4
MANHOLE
N 1884761.01
E 1156385.15

CB-7
CATCH BASIN
N 1884622.82
E 1156023.05

CB-6
CATCH BASIN
N 1884628.74
E 1156207.61

INSTALL 24" x 24" RESTRICTOR PLATE WITH 6" DIA ORIFICE ON DOWNSTREAM PIPE OPENING IN CB-6 (3305-728)

(5) CAP PIPE FOR END OF PHASE 1

MH-3
MANHOLE
N 1884530.41
E 1156405.36

CB-1
CATCH BASIN
N 1884306.12
E 1156316.88
(3305-714) (3305-715)

MH-2
MANHOLE
N 1884306.15
E 1156306.88

20' OPENING
CANTILEVER SLIDE GATE (3231-425)
CENTER AT
N 1884171.50
E 1156215.88

20' OPENING
CANTILEVER SLIDE GATE (3231-425)
CENTER AT
N 1884031.72
E 1156220.82

MH-1
MANHOLE
N 1884001.20
E 1156257.00

(2) CHAIN LINK FENCE (3231-410), TYP

MH-1A
MANHOLE
N 1884105.13
E 1156274.00

CB-5
CATCH BASIN
N 1884096.28
E 1156328.10

INSTALL 24"x24" RESTRICTOR PLATE WITH 6" DIA ORIFICE IN CB-5 (3305-728) 1

INSTALL 24"x24" RESTRICTOR PLATE WITH 6" DIA ORIFICE IN CB-1 (3305-728)

(6) (3123-115)

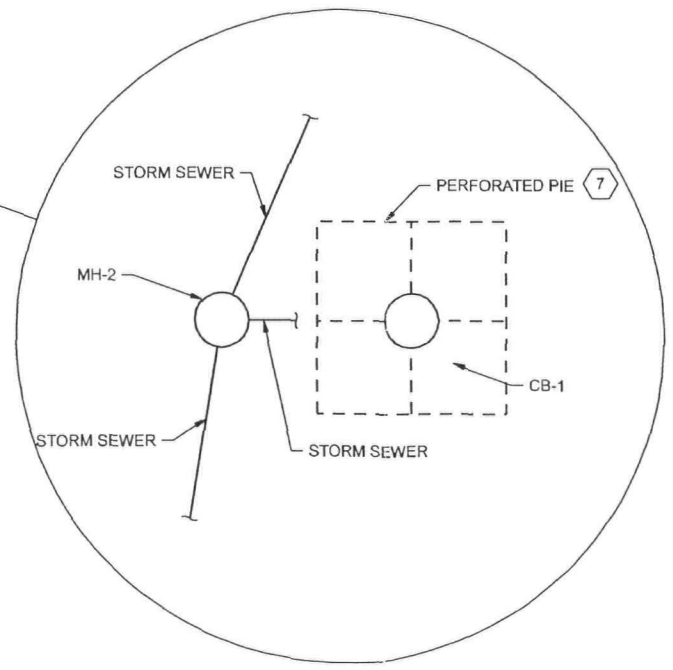
(7)

ALTERNATE BID ITEM #2:
PROPOSED PLACEMENT OF CA-1 AGGREGATE. PLACEMENT OF CA-1 IS PROPOSED AS AN ALTERNATIVE TO THE EARTH FILL WITH TOPSOIL OR GRANULAR FILL COVER MATERIALS. LOCATION OF CA-1 IS SUBJECT TO CHANGE.

CB-3
CATCH BASIN
N 1884542.30
E 1156415.40

INSTALL 30"x30" RESTRICTOR PLATE WITH 9" DIA ORIFICE ON DOWNSTREAM PIPE IN CB-2 (3305-728) 1

CB-2
CATCH BASIN
N 1884530.38
E 1156415.36



N

0 50 100 150
Scale In Feet

DRAWING NOTE:
1. REFER TO DRAWING C-7 FOR SITE PLAN KEY NOTES.

NO.	DATE	DSGN	DR	CHK	APVD
2	08/07/08	BA BROWN	MA GERIK	AR JONES	APVD
1	06/27/08			REVISION	

CONFORMED FOR CONSTRUCTION
ADDENDUM NO. 1

JCH	RAY	RAY	RA YOLO
MAG	BY	APVD	

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CH2MHILL

CIVIL
SITE PLAN
SOUTH

ISSUED FOR 90% REVIEW

VERIFY SCALE
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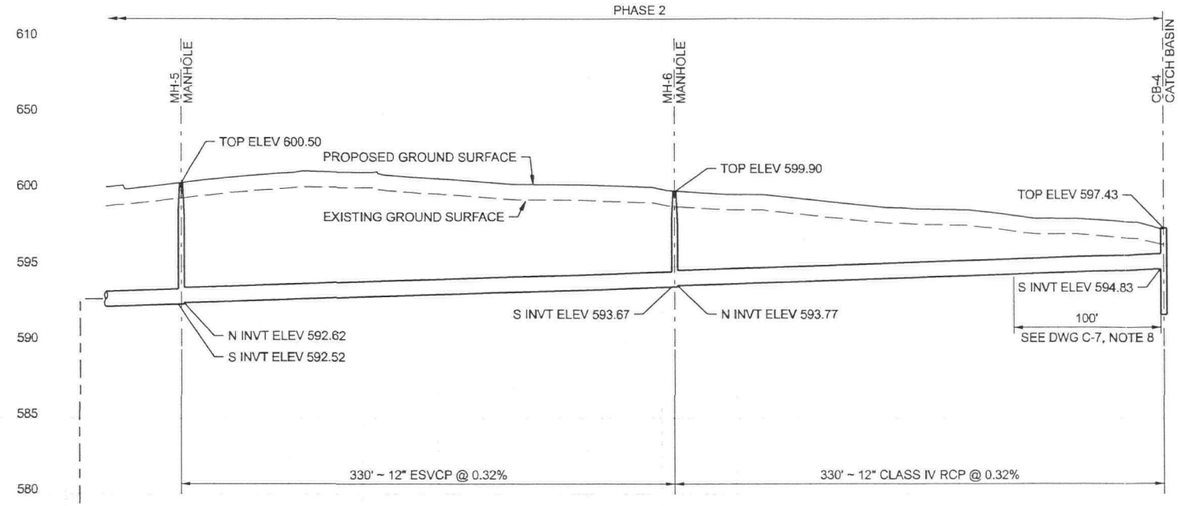
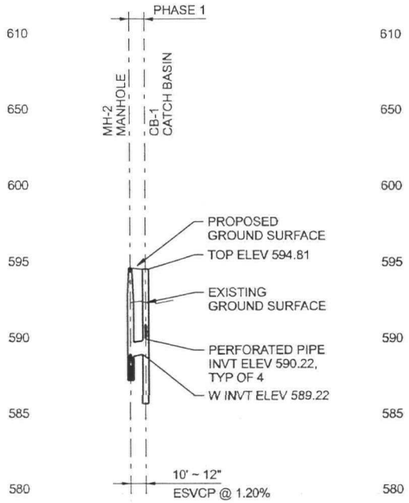
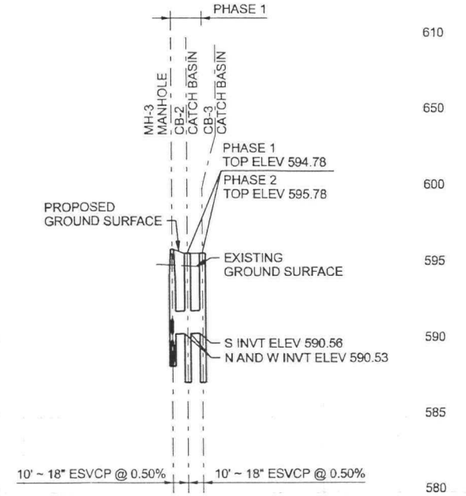
0 1"

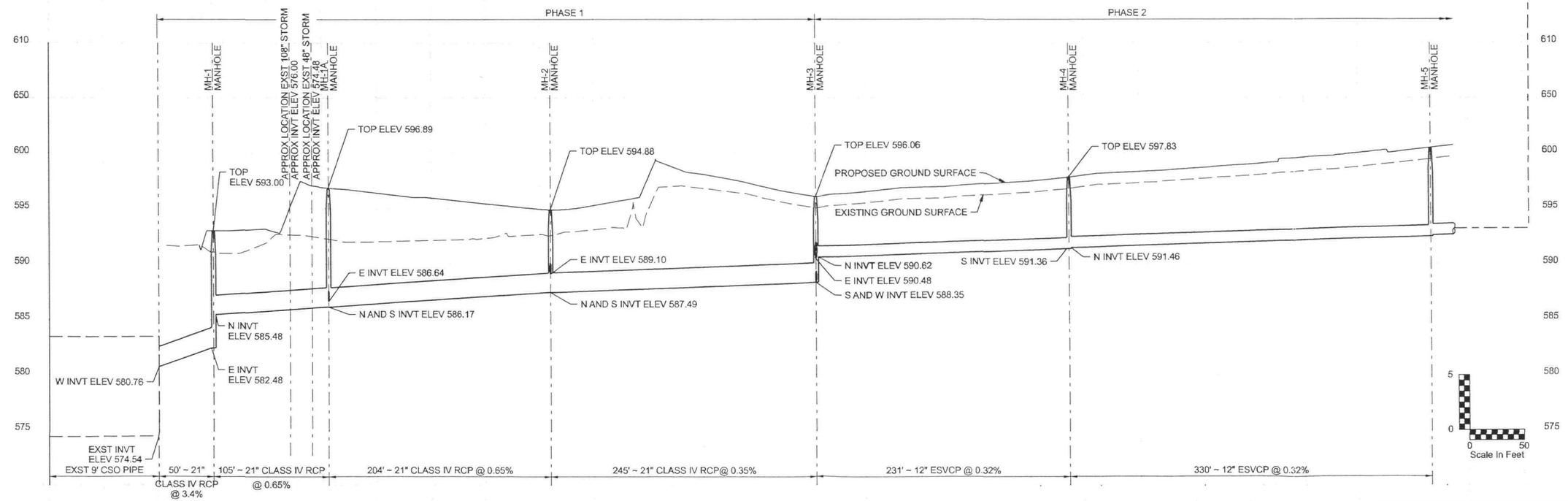
DATE	JUNE 2008
PROJ	327757
DWG	C-8
SHEET	10

FILENAME: dn05c008_327757.dgn PLOT DATE: 8/7/2008 PLOT TIME: 11:26:10 AM









NO.	DATE	DSGN	DR	CHK	APVD	BY
2	08/07/08	TW GHYLIN	MA GERIK	AR JONES	RA YOLO	RAY
1	06/27/08					JCH MAG RAY

CONFORMED FOR CONSTRUCTION
ADDENDUM NO. 1
REVISION

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CH2MHILL

CIVIL

STORM SEWER PROFILES

VERIFY SCALE
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0 1"

DATE	JUNE 2008
PROJ	327757
DWG	C-9
SHEET	11

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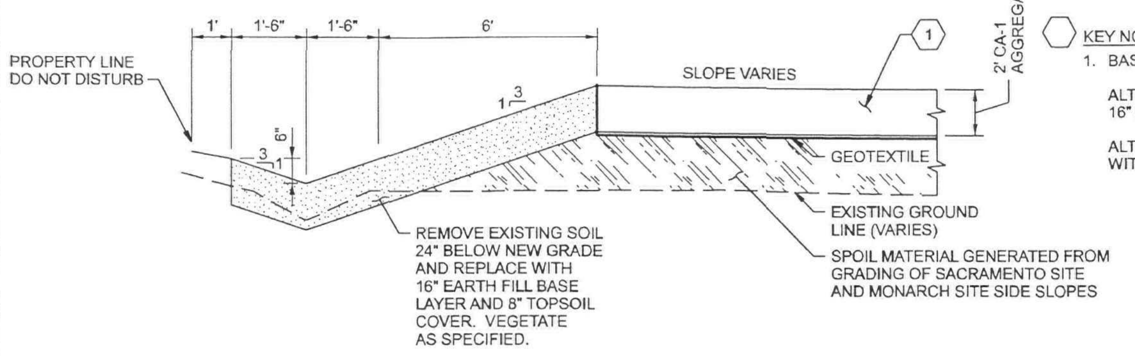
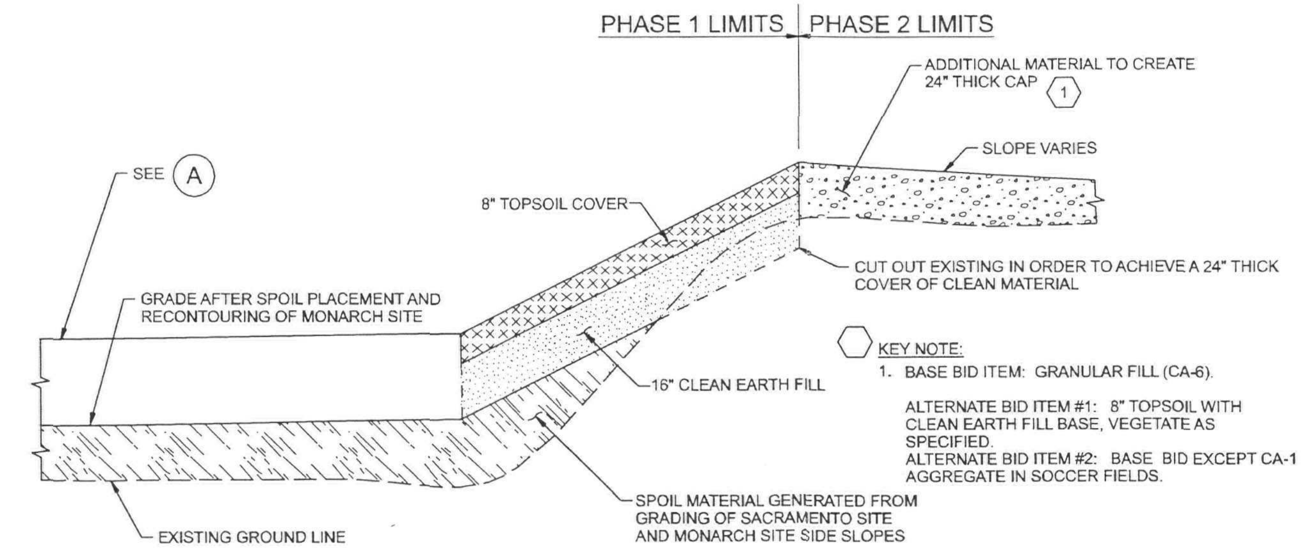
GREGER A. YOLO 062-060910 REGISTERED PROFESSIONAL ENGINEER STATE OF ILLINOIS
Expires 11/30/09

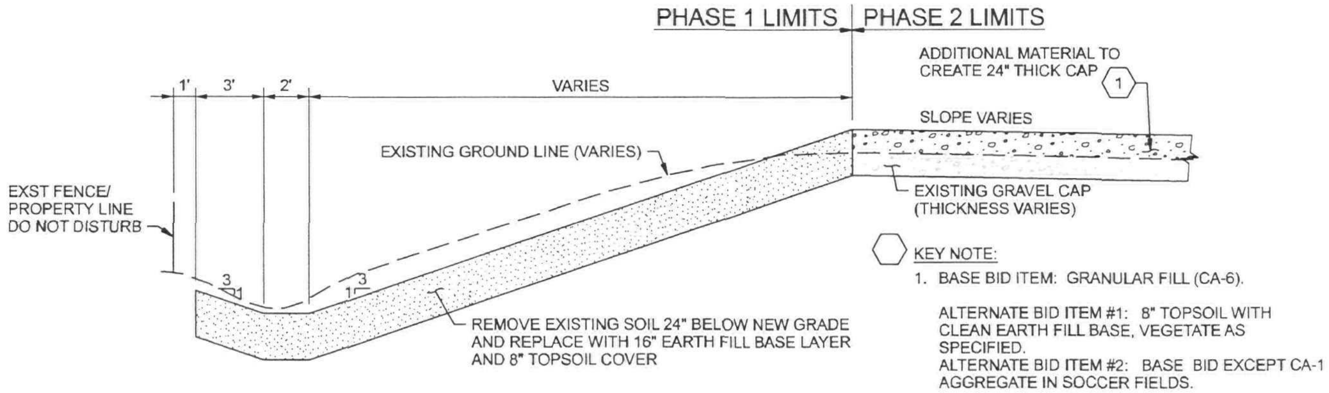
FILENAME: dn05c009_327757.dgn PLOT DATE: 8/7/2008 PLOT TIME: 11:40:04 AM



A MONARCH SITE CAP SECTION
NTS



C MONARCH SITE TO SACRAMENTO SITE TRANSITION SECTION
NTS



B SACRAMENTO SITE CAP SECTION
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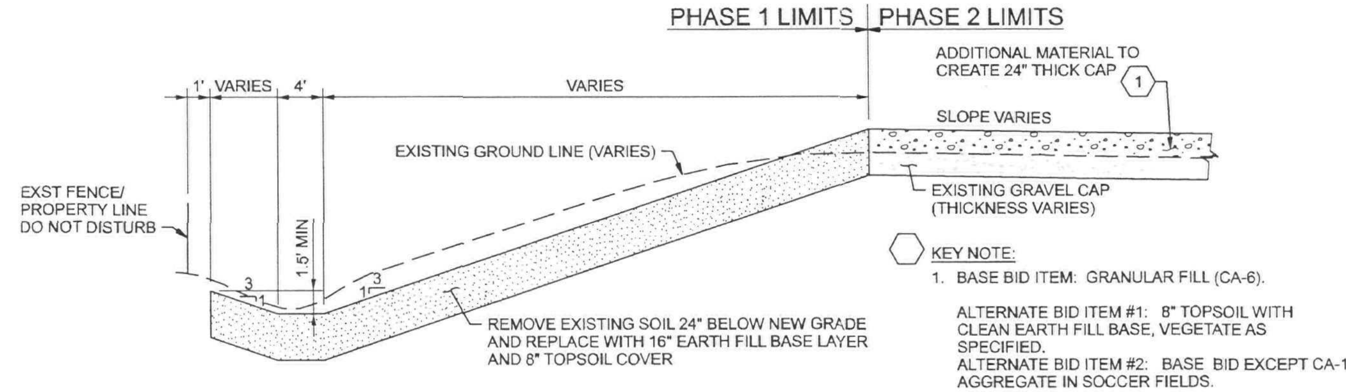
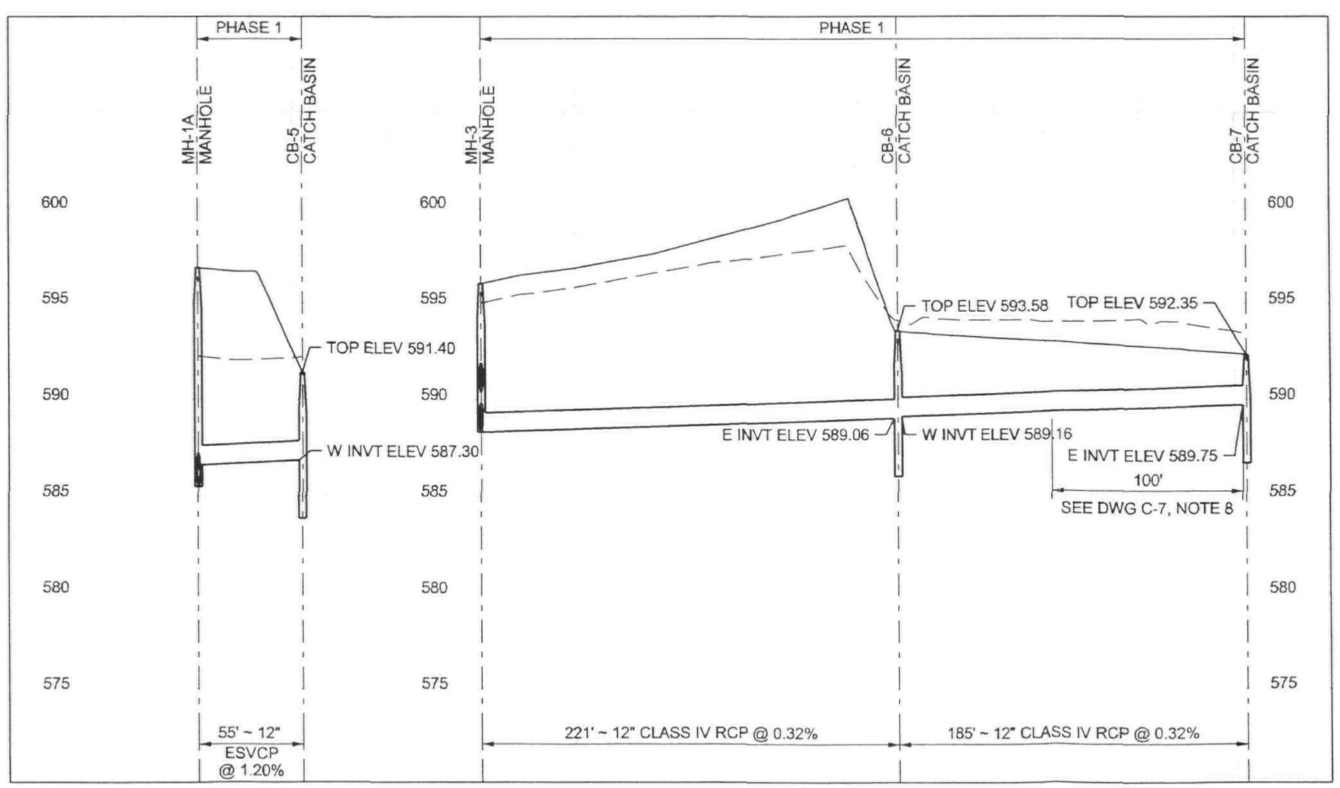
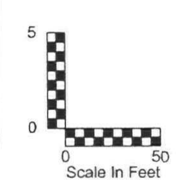


D SACRAMENTO SITE CAP SECTION-NORTHWEST SIDE SLOPE
NTS



STORM SEWER PROFILE



1

CONFORMED FOR CONSTRUCTION ADDENDUM NO. 1

NO.	DATE	REVISION	BY	APVD
2	08/07/08	CONFORMED FOR CONSTRUCTION	JCH	RAY
1	06/27/08	ADDENDUM NO. 1	MAG	RAY

DSGN TW GHYLIN | DR MA GERIK | CHK AR JONES | APVD RA YOLO

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CH2MHILL

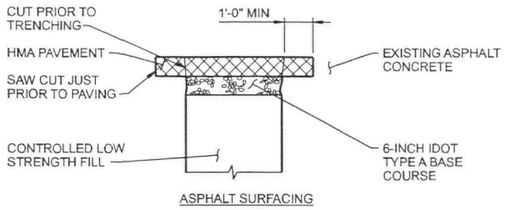
CIVIL
TYPICAL SECTIONS AND STORM SEWER PROFILES

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	327757
DWG	C-10
SHEET	12

ISSUED FOR 90% REVIEW

FILENAME: dn05c010_327557.dgn PLOT DATE: 8/7/2008 PLOT TIME: 11:58:10 AM



ASPHALT SURFACING

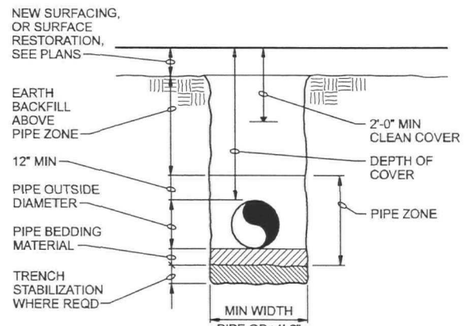
NOTES:

1. HMA PAVEMENT SHALL CONSIST OF A 2-INCH IL-19.02 BINDER LEVELING COURSE AND 2-INCH IL-9.5L SURFACE COURSE.
2. MATERIALS AND SPECIFICATIONS SHALL CONFORM TO ILLINOIS DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION UNLESS OTHERWISE NOTED.
3. IF LIFTS NOT PLACED SIMULTANEOUSLY USE TACK COAT BETWEEN LIFTS.

ASPHALT RESTORATION

NTS

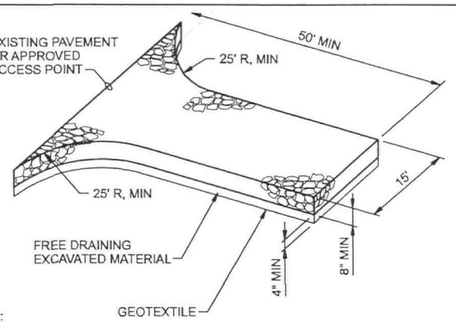
3123-115



TYPICAL TRENCH

NTS

3125-110



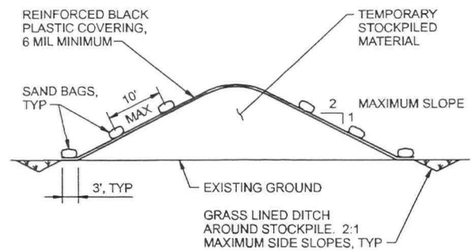
NOTES:

1. THE STRUCTURE'S THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. AT THE END OF EACH CONSTRUCTION DAY, ALL SEDIMENT DEPOSITED ON THE ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE. WASHING THE ROADWAY IS NOT PERMITTED.
2. ROCK CONSTRUCTION SHALL BE BUILT AT ALL LOCATIONS WHERE THE CONTRACTOR WILL ACCESS THE CONSTRUCTION SITE FROM ANY PAVED ROAD, PUBLIC OR PRIVATE. CONTRACTOR SHALL UTILIZE THE ROCK CONSTRUCTION WHENEVER ANY VEHICLE LEAVES AN UNIMPROVED AREA ONTO A PAVED ROAD.
3. ROCK SHALL BE GRADE 3, CLASS A AS SPECIFIED IN ILLINOIS DOT SECTION 1005.01 FOR AGGREGATE DITCH CHECK. FILTER FABRIC SHALL BE USED FOR GRADE 4 STONE AS SPECIFIED IN ILLINOIS DOT SECTION 1080.03.

GRAVEL CONSTRUCTION ENTRANCE

NTS

3125-130



NOTES:

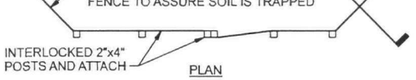
1. ALL SEAMS SHALL BE TAPED OR WEIGHTED DOWN FULL LENGTH. ALL SEAMS SHALL HAVE A MINIMUM 12" OVERLAP.
2. SEAMS PARALLEL TO THE SLOPE CONTOUR SHALL HAVE THE UPHILL SHEET OVERLAP THE DOWN HILL SHEET.
3. NO SURFACE RUN-OFF SHALL BE ALLOWED TO RUN UNDER THE PLASTIC COVERING.
4. DRAINAGE FROM AREAS COVERED BY REINFORCED PLASTIC SHEETING SHALL BE CONTROLLED SUCH THAT NO DISCHARGE OCCURS DIRECTLY ONTO UNCONTROLLED DISTURBED AREAS OF THE CONSTRUCTION SITE.
5. ALL SAND BAGS SHALL BE MAINTAINED IN PLACE WITH ROPE.

1

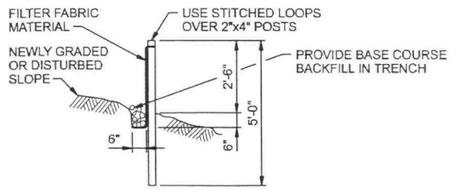
STOCKPILE COVER

NTS

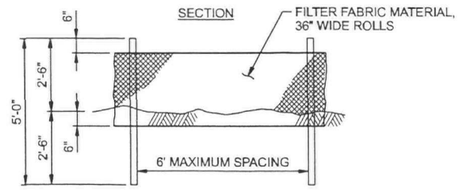
3125-140



PLAN



SECTION



ELEVATION

NOTES:

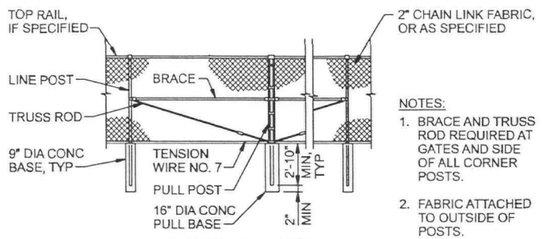
1. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.
2. 2"x4" DOUGLAS FIR OR STEEL FENCE POSTS. STEEL FENCE POSTS SHALL BE USED FOR INLET PROTECTION.
3. STITCHED LOOPS TO BE INSTALLED DOWNHILL SIDE OF SLOPE.
4. COMPACT ALL AREAS OF FILTER FABRIC TRENCH.
5. SILT FENCE SHALL BE AS SPECIFIED IN ILLINOIS DOT SECTION 1080.02.

SILT FENCE

NTS

3125-165

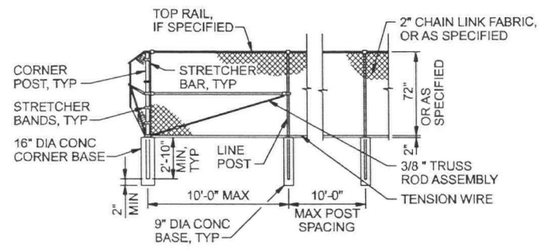
LINE POST CONNECTION TOP RAIL CONNECTION



NOTES:

1. BRACE AND TRUSS ROD REQUIRED AT GATES AND SIDE OF ALL CORNER POSTS.
2. FABRIC ATTACHED TO OUTSIDE OF POSTS.

TYPICAL PULL POST

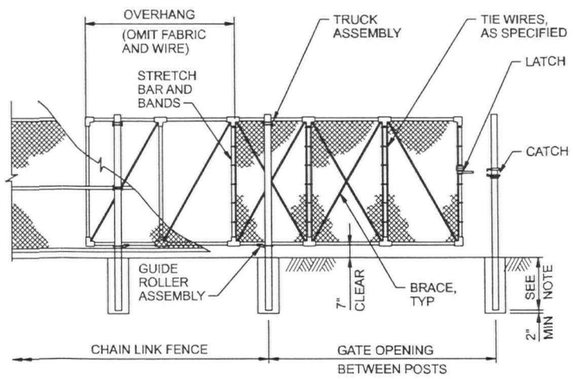


TYPICAL CORNER POST

CHAIN LINK FENCE

NTS

3231-410

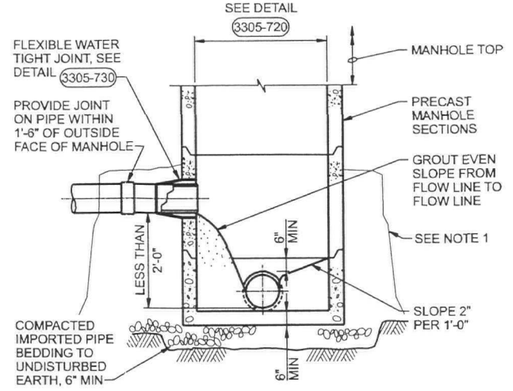


NOTE:
POST SETS PER MANUFACTURER'S RECOMMENDATIONS FOR GATE OPENING AND GATE POST SIZES.

CANTILEVER SLIDE GATE

NTS

3231-425



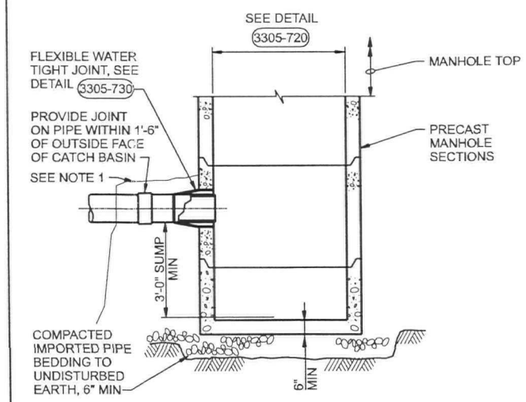
NOTE:

1. BACKFILL STRUCTURE TO TOP OF PIPES WITH CONTROLLED LOW STRENGTH FILL WITHIN 5 FEET FROM STRUCTURE. PROTECT DURING PLACEMENT AND INSTALL LOW STRENGTH FILL IN LIFTS TO AVOID FLOATATION.

MANHOLE BASE SECTION

NTS

3305-710



NOTE:

1. BACKFILL STRUCTURE TO TOP OF PIPES WITH CONTROLLED LOW STRENGTH FILL WITHIN 5 FEET FROM STRUCTURE. PROTECT DURING PLACEMENT AND INSTALL LOW STRENGTH FILL IN LIFTS TO AVOID FLOATATION.

CATCH BASIN BASE SECTION

NTS

3305-711

REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS
ROGER A. YOLO
062-060810
Expires 11/30/08
8/7/08

NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
2	08/07/08	BA BROWN	MA GERIK	AR JONES		JCH	RAY
1	06/27/08			REVISION		MAG	RAY

CONFORMED FOR CONSTRUCTION
ADDENDUM NO. 1

RA YOLO

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

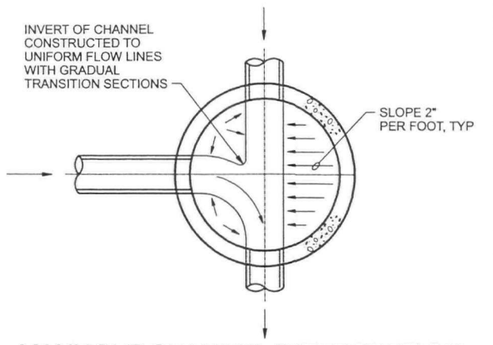
CH2MHILL

CIVIL
DETAILS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

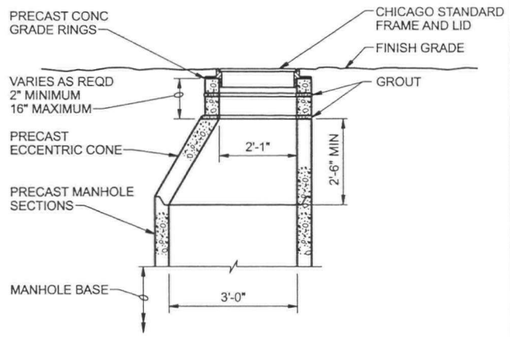
DATE	JUNE 2008
PROJ	327757
DWG	C-11
SHEET	13

ISSUED FOR 80% REVIEW



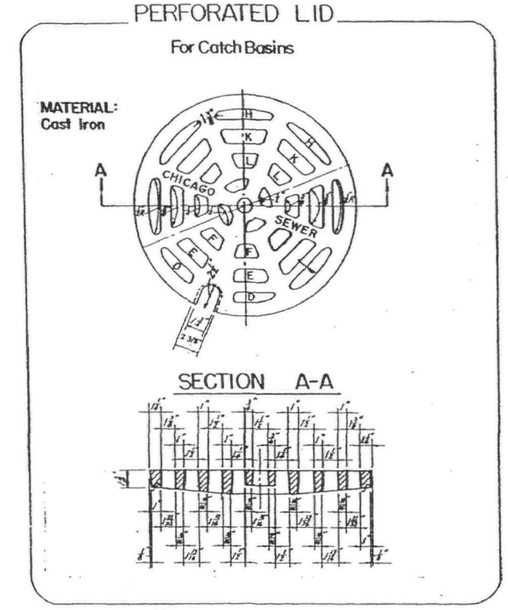
MANHOLE CHANNEL INTERSECTION
NTS

3305-713



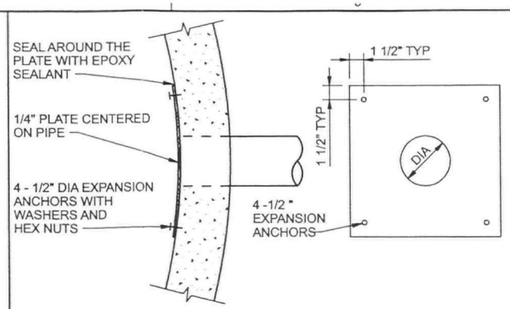
ECCENTRIC MANHOLE AND CATCH BASIN TOP SECTION
NTS

3305-720



CHICAGO STANDARD PERFORATED LID
NTS

3305-726

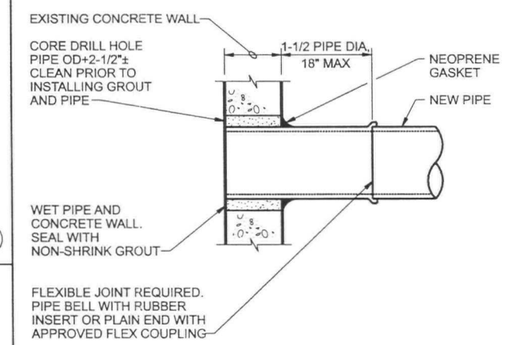


NOTES:

1. A RESTRICTOR SHALL BE INSTALLED IN A CATCH BASIN OR MANHOLE WITH A 2'-0" MINIMUM SUMP.
2. THE RESTRICTOR PLATE AND FASTENERS SHALL BE FABRICATED IN STAINLESS STEEL.
3. PLATE SHALL BE CURVED TO MATCH THE INSIDE RADIUS OF THE CATCH BASIN.

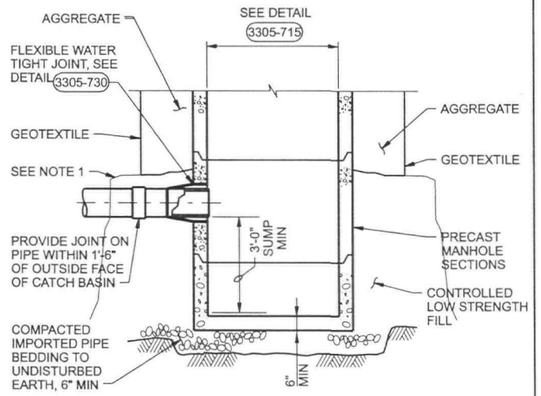
RESTRICTOR PLATE DETAILS
NTS

3305-728



PIPE CONNECTIONS
NTS

3305-730

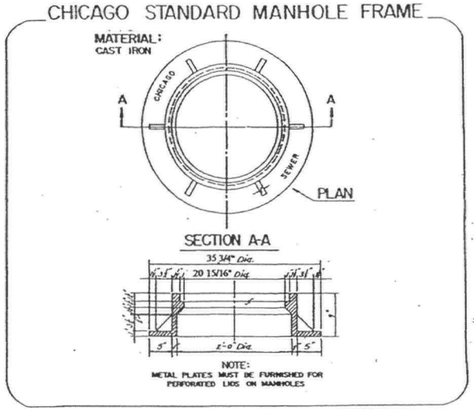


NOTE:

1. BACKFILL STRUCTURE TO TOP OF PIPES WITH CONTROLLED LOW STRENGTH FILL WITHIN 5 FEET FROM STRUCTURE. PROTECT DURING PLACEMENT AND INSTALL LOW STRENGTH FILL IN LIFTS TO AVOID FLOATATION.

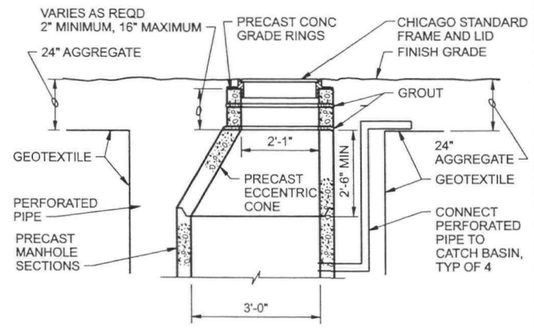
CATCH BASIN BASE SECTION
NTS

3305-714



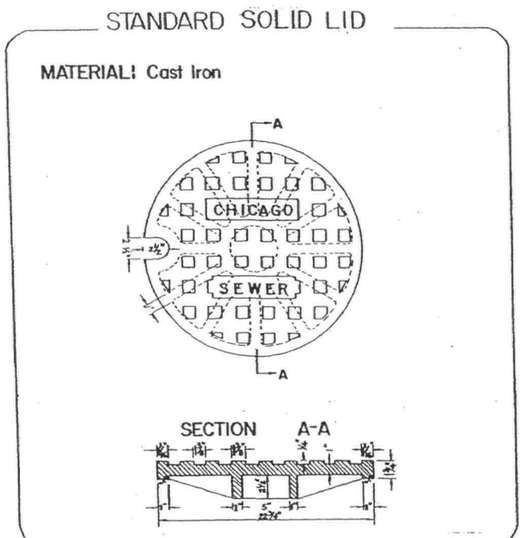
CHICAGO STANDARD MANHOLE FRAME
NTS

3305-725



ECCENTRIC CATCH BASIN TOP SECTION
NTS

3305-715



CHICAGO STANDARD SOLID LID
NTS

3305-727

NO.	DATE	DSGN	DR	CHK	REVISION	BY	APVD
2	08/07/08	BA BROWN	MA GERIK	AR JONES	CONFORMED FOR CONSTRUCTION	JCH	RAY
1	06/27/08				ADDENDUM NO. 1	MAG	RAY
						RA YOLO	

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

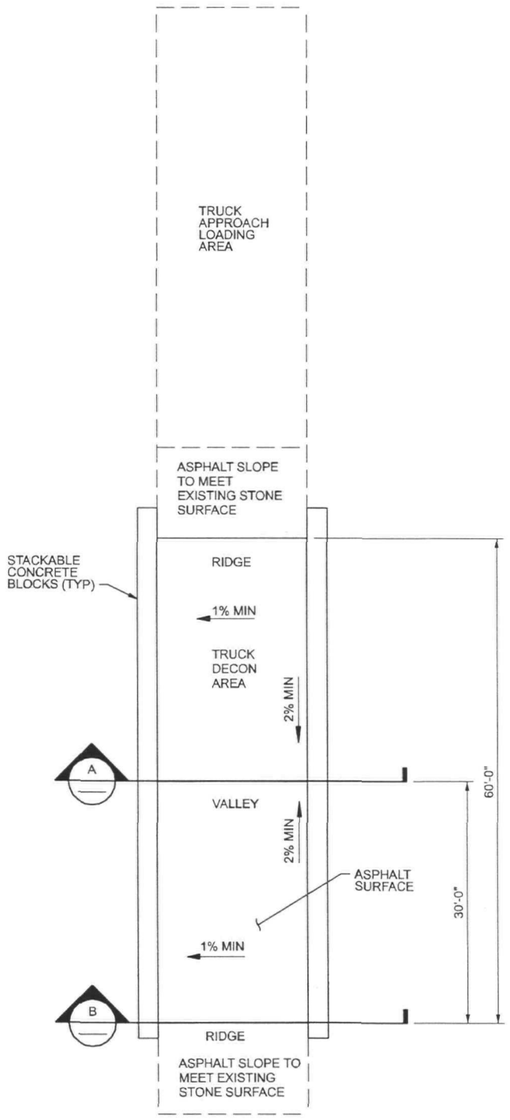
CH2MHILL

CIVIL
DETAILS

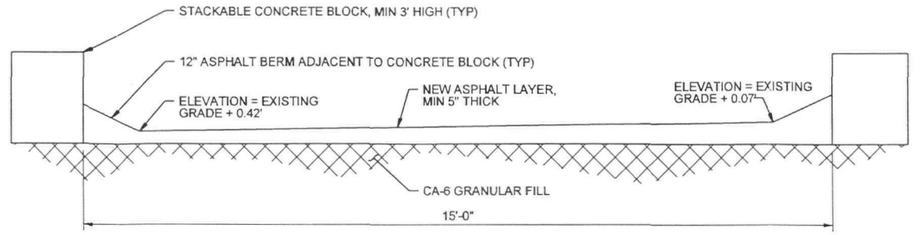
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	365109
DWG	C-12
SHEET	14

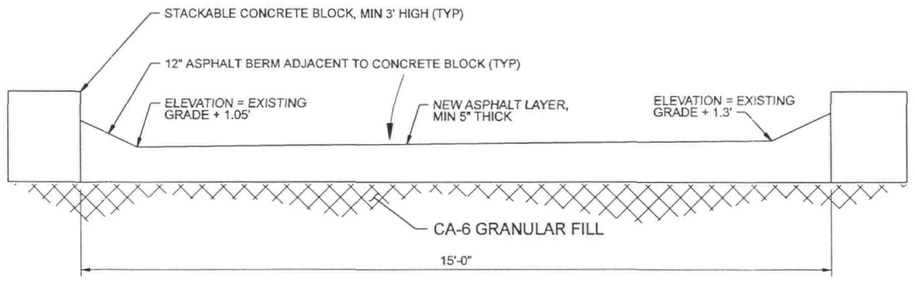
ISSUED FOR 90% REVIEW



TRUCK LOADING/DECON AREA PLAN
NTS



A TRUCK DECON AREA VALLEY
NTS



B TRUCK DECON AREA RIDGE
NTS

NOTES:

1. TRUCK DECON AREA TO BE CONSTRUCTED AND MAINTAINED BY CONTRACTOR.
2. NEW ASPHALT LAYER IS MINIMUM 5" THICK. MATERIAL BETWEEN NEW ASPHALT LAYER AND STONE SURFACE CAN BE APPROPRIATELY GRADED AND COMPACTED AGGREGATE.
3. MATERIALS AND SPECIFICATIONS FOR HEAVY VOLUME MIX SHALL CONFORM TO IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION UNLESS OTHERWISE NOTED.

1 DECONTAMINATION AREA
NTS

ROGER A. YOLO — LICENSED PROFESSIONAL ENGINEER OF ILLINOIS — Expires 11/30/08

NO.	DATE	DSGN	BY	CHK	APVD
2	08/07/08	DR	JCH	MA GERIK	RAY
1	06/27/08	ENGINEER	MAG	AR JONES	RAY
		REVISION			APVD

CONFORMED FOR CONSTRUCTION ADDENDUM NO. 1

RA YOLO

ISSUED FOR 90% REVIEW

CH2MHILL

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
2800 SOUTH SACREMENTO AVENUE
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CIVIL
DECONTAMINATION PAD DETAIL

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

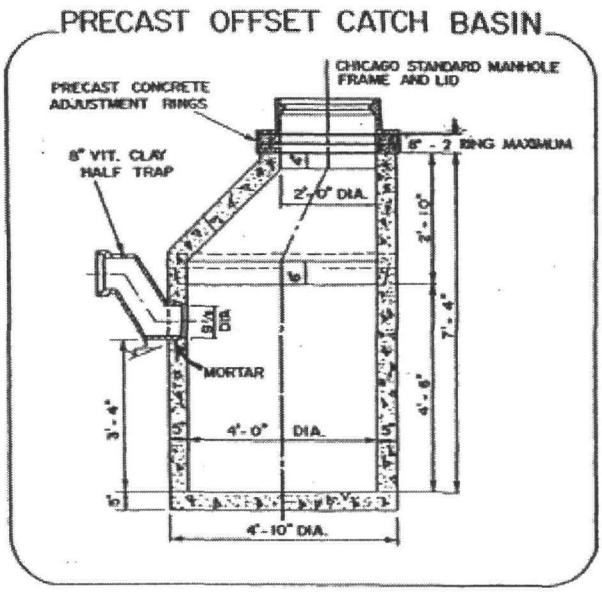
DATE	JUNE 2008
PROJ	365109
DWG	C-13
SHEET	15

FILENAME: dn05c013_327757.dgn PLOT DATE: 8/8/2008 PLOT TIME: 10:42:16 AM

Modification #1

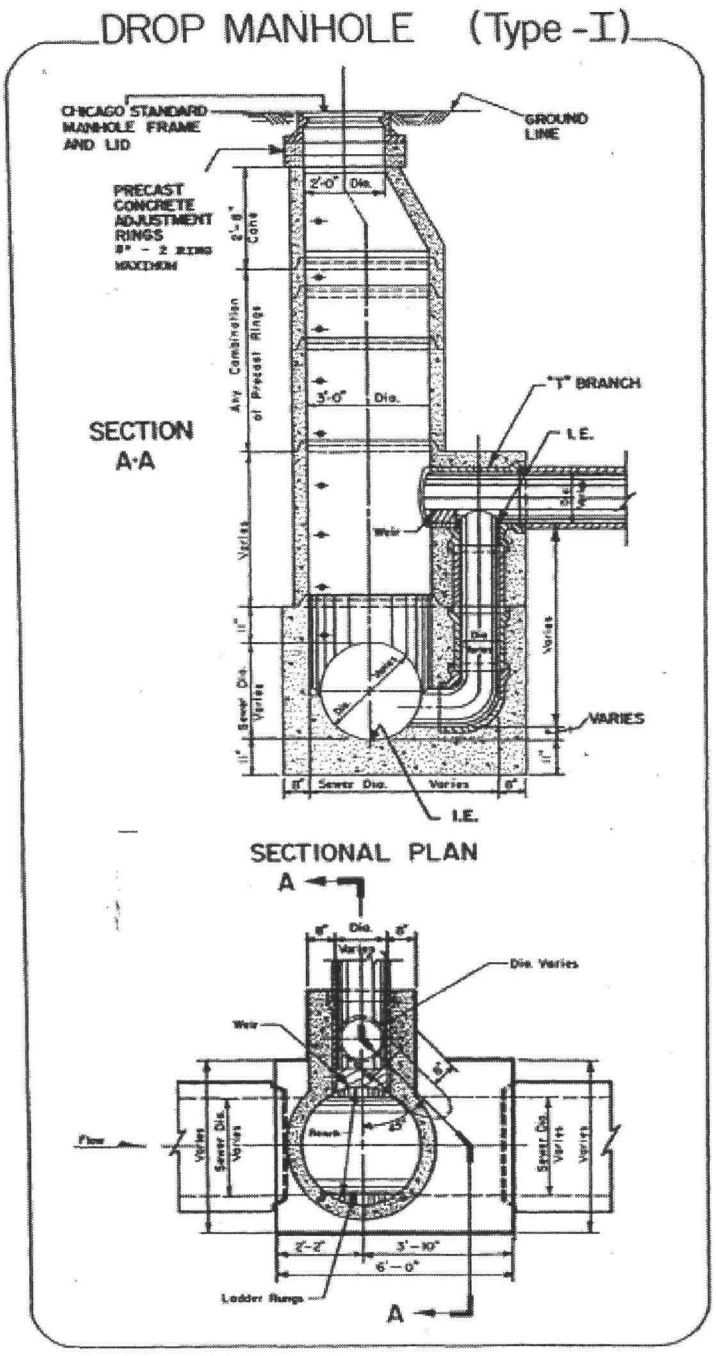
Issued August 13, 2008

Item #1: Catch Basin Section Detail 3305-711 is replaced with the precast offset catch basin with half-trap shown below, except that the sump will be a minimum of 2 feet. Inverts shown on the plans shall be for the main pipe segment immediately down slope of the half-trap.



Item #2: At Manhole 3, the north and east inverts will be changed as follows. The N INVT elevation will be lowered 590.32. The E INVT will be lowered to 590.34. The pipe slope between Manhole 4 and Manhole 3 will be increased to 0.0045 feet per foot. The pipe slope between Catch Basin 2 and Manhole 3 will be increased to 0.019 feet per foot.

Item #3: For Manhole 1, the manhole detail will be replaced with the Type I Drop Manhole shown below. The drop diameter will be 12 inches made of Class IV RCP.



Item #4: The pipe slope between Catch Basin 3 and Catch Basin 2 is changed to 0.35%. The invert elevations at Catch Basins 3 and 2 remain the same.

Documentation of Plan Modifications

All modifications will be documented on the final as-built plans that will be submitted to the Department of Water Management sewer inspector for approval within 14 days after completion of construction.

Attachment 3 – Modeling Calculations

Stage, Storage Discharge Calculations

Area 1

Stage (ft)	Depth Above MH Invert (ft)	Depth above Rim (ft)	Manhole Storage (acre-ft)	Above ground Storage (acre-ft)	Total Storage (acre-ft)	Discharge CB (cfs)	Discharge through 12" Pipe cfs	**Total Discharge 12"** (cfs)
589.38	0	0	0.0000		0.0000		0.0	**0.0**
590.38	1	0	0.0003		0.0003		3.8	**3.8**
591.38	2	0	0.0006		0.0006		5.4	**5.4**
592.38	3	0	0.0009		0.0009		6.7	**6.7**
593.38	4	0	0.0012		0.0012		7.7	**7.7**
594.38	5	0	0.0014		0.0014		8.6	**8.6**
594.78	5.4	0	0.0016	0	0.0016		8.9	**8.9**
595.5	6.12	0.72	0.0016	0.08	0.0816	4.1	9.5	**4.1**
596	6.62	1.22	0.0016	0.16	0.1616	5.3	9.9	**5.3**
597	7.62	2.22	0.0016	1.03	1.0316	7.2	10.6	**7.2**
598	8.62	3.22	0.0016	3.52	3.5216	8.6	11.3	**8.6**

No additional MH storage above the rim elevation

Orifice = 0.61*A*SQRT(2*g*h)

Restrictor Diameter (inches)	Area (sf)
12	0.79

C = 0.61 per chicago regulations

NEENAH FOUNDRY COMPANY 800-558-5075 FAX: 920-729-3661

-- Inlet Grate Capacities Menu --

Jump to: >HOME >BACK

Weir & Orifice Flow Comparison

$Q = 0.6A\sqrt{2gh}$
(Orifice Flow Equation)

Q = Capacity in CFS
A = Free open area of grate in sq. ft.
g = 32.2 (feet per sec/sec)
h = Head in feet

Orifice Information

Instructions:
- Either Select catalog number (will automatically fill in Open Area and Perimeter) or enter your own values
- Enter head value
- Press CALCULATE

The results will determine automatically if your situation falls into a Weir, Transitional or Orifice flow. Additionally, a pop-up window will offer Neenah grates which fall within the parameters chosen.

$Q = 3.3P(h)^{1.5}$
(Weir Equation)

Q = Capacity in CFS
P = Feet perimeter
h = Head in feet

Weir Information

Catalog number and grate type: R-4370-15 D

Feet perimeter (P): 5.9

Calculate

Head in feet (h): 0.72

Free open area in sq. ft. (A): 1.0

Weir capacity in cfs:

Transitional flow in cfs:

Orifice capacity in cfs: 4.1

(Results assume no debris restriction.)

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-- Inlet Grate Capacities Menu --

Jump to: >HOME >BACK

Weir & Orifice Flow Comparison

$Q = 0.6A\sqrt{2gh}$
(Orifice Flow Equation)

Q = Capacity in CFS
A = Free open area of grate in sq. ft.
g = 32.2 (feet per sec/sec)
h = Head in feet

Orifice Information

Instructions:
- Either Select catalog number (will automatically fill in Open Area and Perimeter) or enter your own values
- Enter head value
- Press CALCULATE

The results will determine automatically if your situation falls into a Weir, Transitional or Orifice flow. Additionally, a pop-up window will offer Neenah grates which fall within the parameters chosen.

$Q = 3.3P(h)^{1.5}$
(Weir Equation)

Q = Capacity in CFS
P = Feet perimeter
h = Head in feet

Weir Information

Catalog number and grate type: R-4370-15 D

Feet perimeter (P): 5.9

Calculate

Head in feet (h): 1.22

Free open area in sq. ft. (A): 1.0

Weir capacity in cfs:

Transitional flow in cfs:

Orifice capacity in cfs: 5.3

(Results assume no debris restriction.)

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-- Inlet Grate Capacities Menu --

Jump to: >HOME >BACK

Weir & Orifice Flow Comparison

$Q = 0.6A\sqrt{2gh}$
(Orifice Flow Equation)

Q = Capacity in CFS
A = Free open area of grate in sq. ft.
g = 32.2 (feet per sec/sec)
h = Head in feet

Orifice Information

Instructions:
- Either Select catalog number (will automatically fill in Open Area and Perimeter) or enter your own values
- Enter head value
- Press CALCULATE

The results will determine automatically if your situation falls into a Weir, Transitional or Orifice flow. Additionally, a pop-up window will offer Neenah grates which fall within the parameters chosen.

$Q = 3.3P(h)^{1.5}$
(Weir Equation)

Q = Capacity in CFS
P = Feet perimeter
h = Head in feet

Weir Information

Catalog number and grate type: R-4370-15 D

Feet perimeter (P): 5.9

Calculate

Head in feet (h): 2.22

Free open area in sq. ft. (A): 1.0

Weir capacity in cfs:

Transitional flow in cfs:

Orifice capacity in cfs: 7.2

(Results assume no debris restriction.)

NOTE: The above results do not account for the dome height of Beehive-type grates. Please take note of this when determining the Head (h) value.

For additional information regarding Neenah Inlet Grate Capacities, please contact our Product Engineer, Steve Akkala, at 920-725-7000 or at sakkala@nfco.com.

NEENAH FOUNDRY COMPANY 800-558-5075 FAX: 920-729-3661

t Grate Capacities Menu --

Jump to: >HOME >BACK

Weir & Orifice Flow Comparison

ation)

FS
A = Free open area of grate in sq. ft.
g = 32.2 (feet per sec/sec)
h = Head in feet

Orifice Information

Instructions:
- Either Select catalog number (will automatically fill in Open Area and Perimeter) or enter your own values
- Enter head value
- Press CALCULATE

The results will determine automatically if your situation falls into a Weir, Transitional or Orifice flow. Additionally, a pop-up window will offer Neenah grates which fall within the parameters chosen.

$Q = 3.3P(h)^{1.5}$
(Weir Equation)

Q = Capacity in CFS
P = Feet perimeter
h = Head in feet

Weir Information

Catalog number and grate type: R-4370-15 D

Feet perimeter (P): 5.9

Calculate

Head in feet (h): 3.22

Free open area in sq. ft. (A): 1.0

Weir capacity in cfs:

Transitional flow in cfs:

Orifice capacity in cfs: 8.6

(Results assume no debris restriction.)

NOTE: The above results do not account for the dome height of Beehive-type grates. Please take note of this when determining the Head (h) value.

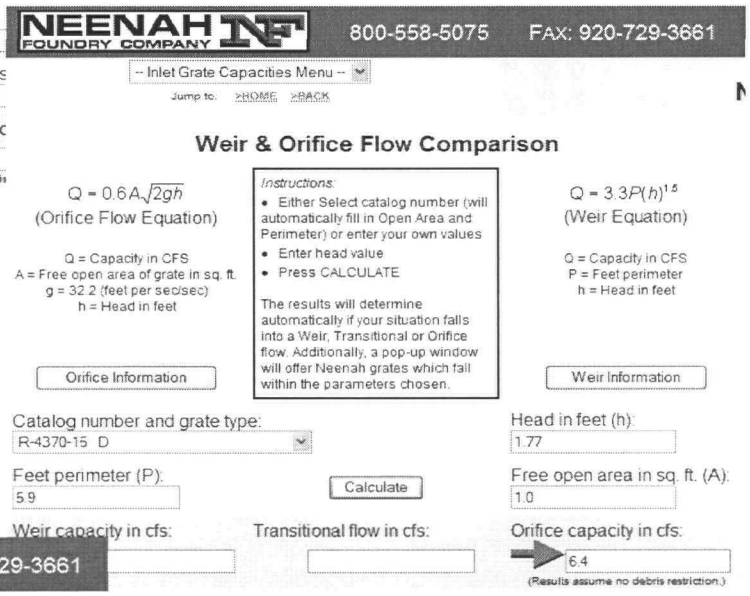
For additional information regarding Neenah Inlet Grate Capacities, please contact our Product Engineer, Steve Akkala, at 920-725-7000 or at sakkala@nfco.com.

Area 2

Stage (ft)	Depth Above MH Invert (ft)	Depth above Rim (ft)	Storage (acre-ft)	Manhole Storage (acre-ft)	Total Storage (acre-ft)	Discharge CB (cfs)	Discharge Restrictor (cfs)	Total Discharge (cfs)
591.83	0	0		0.0000	0.0000	0	0.00	0.00
592.83	1	0		0.0003	0.0003	0	0.43	0.43
593.83	2	0		0.0006	0.0006	0	0.60	0.60
594.83	3	0		0.0009	0.0009	0	0.74	0.74
595.83	4	0		0.0012	0.0012	0	0.85	0.85
596.23	4.4	0	0	0.0013	0.0013	0	0.90	0.90
597	5.17	0.77	0.01	0.0013	0.0113	4.2	0.97	0.97
598	6.17	1.77	0.24	0.0013	0.2413	6.4	1.06	1.06
599	7.17	2.77	1.17	0.0013	1.1713	8	1.14	1.14
				No additional MH storage above the rim elevation				

Orifice = 0.61*A*SQRT(2*g*h)
Restrictor Diameter = 4 inches
A = 0.087266 ft^2
C = 0.61 per chicago regulations


NEENAH FOUNDRY COMPANY
800-558-5075
FAX: 920-729-3661
-- Inlet Grate Capacities Menu --
Jump to: >HOME >BACK
Weir & Orifice Flow Comparison
Q = 0.6A√2gh
(Orifice Flow Equation)
Q = Capacity in CFS
A = Free open area of grate in sq. ft.
g = 32.2 (feet per sec/sec)
h = Head in feet
Orifice Information
Instructions:
• Either Select catalog number (will automatically fill in Open Area and Perimeter) or enter your own values
• Enter head value
• Press CALCULATE
The results will determine automatically if your situation falls into a Weir, Transitional or Orifice flow. Additionally, a pop-up window will offer Neenah grates which fall within the parameters chosen.
Q = 3.3P(h)^1.5
(Weir Equation)
Q = Capacity in CFS
P = Feet perimeter
h = Head in feet
Weir Information
Catalog number and grate type:
R-4370-15 D
Head in feet (h):
0.77
Feet perimeter (P):
5.9
Calculate
Free open area in s
1.0
Weir capacity in cfs:
Transitional flow in cfs:
Orifice capacity in c
4.2
(Results assume no debris


NEENAH FOUNDRY COMPANY
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-- Inlet Grate Capacities Menu --
Jump to: >HOME >BACK
Weir & Orifice Flow Comparison
Q = 0.6A√2gh
(Orifice Flow Equation)
Q = Capacity in CFS
A = Free open area of grate in sq. ft.
g = 32.2 (feet per sec/sec)
h = Head in feet
Orifice Information
Instructions:
• Either Select catalog number (will automatically fill in Open Area and Perimeter) or enter your own values
• Enter head value
• Press CALCULATE
The results will determine automatically if your situation falls into a Weir, Transitional or Orifice flow. Additionally, a pop-up window will offer Neenah grates which fall within the parameters chosen.
Q = 3.3P(h)^1.5
(Weir Equation)
Q = Capacity in CFS
P = Feet perimeter
h = Head in feet
Weir Information
Catalog number and grate type:
R-4370-15 D
Head in feet (h):
1.77
Feet perimeter (P):
5.9
Calculate
Free open area in sq. ft. (A):
1.0
Weir capacity in cfs:
Transitional flow in cfs:
Orifice capacity in cfs:
6.4
(Results assume no debris restriction.)


NEENAH FOUNDRY COMPANY
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-- Inlet Grate Capacities Menu --
Jump to: >HOME >BACK
Weir & Orifice Flow Comparison
Q = 0.6A√2gh
(Orifice Flow Equation)
Q = Capacity in CFS
A = Free open area of grate in sq. ft.
g = 32.2 (feet per sec/sec)
h = Head in feet
Orifice Information
Instructions:
• Either Select catalog number (will automatically fill in Open Area and Perimeter) or enter your own values
• Enter head value
• Press CALCULATE
The results will determine automatically if your situation falls into a Weir, Transitional or Orifice flow. Additionally, a pop-up window will offer Neenah grates which fall within the parameters chosen.
Q = 3.3P(h)^1.5
(Weir Equation)
Q = Capacity in CFS
P = Feet perimeter
h = Head in feet
Weir Information
Catalog number and grate type:
R-4370-15 D
Head in feet (h):
2.77
Feet perimeter (P):
5.9
Calculate
Free open area in sq. ft. (A):
1.0
Weir capacity in cfs:
Transitional flow in cfs:
Orifice capacity in cfs:
8
(Results assume no debris restriction.)

No Above ground storage on the monarch site for existing conditions
Runoff flows directly into 24" pipe.

SideSlope 1

Area = 0.409 acres

Length = 665 ft

Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Overflow Discharge* (cfs)	Infiltration Discharge	Total Discharge (cfs)	
593	0	0	0	0	0.000	0	0.02	0.00	No CB
593.5	0.5	0	1.5	997.5	0.023	0	0.02	0.02	
594	1	0	4	2660	0.061	0	0.02	0.02	top of channel
594.1	1.1	0.1	4.62	3072.3	0.071	10	0.02	10.45	
594.2	1.2	0.2	5.28	3511.2	0.081	30	0.02	29.53	
594.3	1.3	0.3	5.98	3976.7	0.091	54	0.02	54.24	
594.4	1.4	0.4	6.72	4468.8	0.103	83	0.02	83.50	
594.5	1.5	0.5	7.5	4987.5	0.114	117	0.02	116.69	

Top width 6 ft

Infiltration 0.2 inches/hr

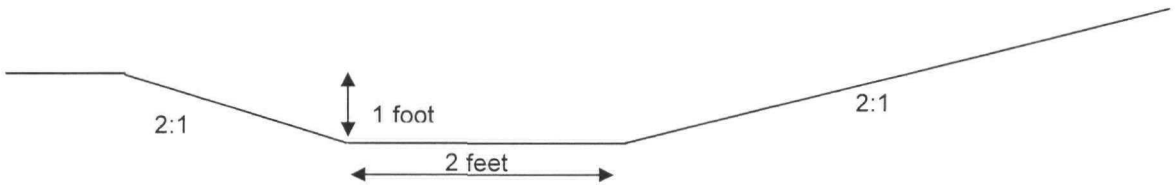
*Overflow Discharge

Weir flow

Q = 3.3P(h)^1.5

Length = 100

Existing Conditions Sacramento SS Cross-Section



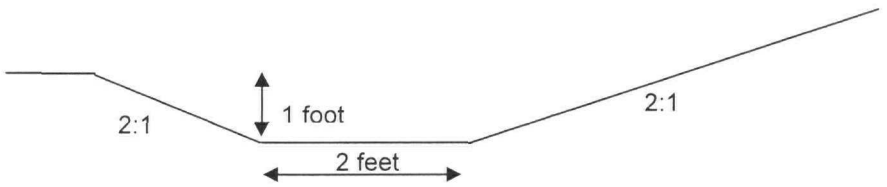
SideSlope 2
Area = 0.961 acres
Length = 1281 ft

Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Overflow Discharge* (cfs)	Infiltration Discharge	Total Discharge (cfs)	
593	0	0	0	0	0.00	0	0.04	0.00	No CB
593.5	0.5	0	1.5	1921.5	0.04	0	0.04	0.04	
594	1	0	4	5124	0.12	0	0.04	0.04	top of channel
594.1	1.1	0.1	4.62	5918.2	0.14	10	0.04	10.47	
594.2	1.2	0.2	5.28	6763.7	0.16	30	0.04	29.55	
594.3	1.3	0.3	5.98	7660.4	0.18	54	0.04	54.26	
594.4	1.4	0.4	6.72	8608.3	0.20	83	0.04	83.52	
594.5	1.5	0.5	7.5	9607.5	0.22	117	0.04	116.71	

*Overflow Discharge
Weir flow
Q = 3.3P(h)^1.5
Length = 100

Top width 6 ft
Infiltration 0.2 inches/hr

Existing Conditions Sacramento SS Cross-Section

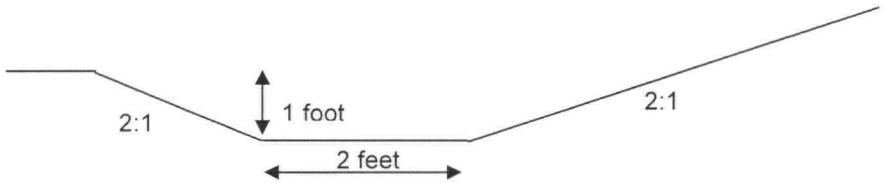


SideSlope 3
Area = 0.596 acres
Length = 701 ft

Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Overflow Discharge* (cfs)	Infiltration Discharge	Total Discharge (cfs)	
593	0	0	0	0	0.00	0	0.02	0.00	No CB
593.5	0.5	0	1.5	1051.5	0.02	0	0.02	0.02	
594	1	0	4	2804	0.06	0	0.02	0.02	top of channel
594.1	1.1	0.1	4.62	3238.6	0.07	10	0.02	10.45	
594.2	1.2	0.2	5.28	3701.3	0.08	30	0.02	29.54	
594.3	1.3	0.3	5.98	4192	0.10	54	0.02	54.24	
594.4	1.4	0.4	6.72	4710.7	0.11	83	0.02	83.50	
594.5	1.5	0.5	7.5	5257.5	0.12	117	0.02	116.69	

*Overflow Discharge — CB - Orifice Flow
Weir flow — Q = 0.6*A*(sqrt(2*g*h)) — Top width 6 ft
Q = 3.3P(h)^1.5 — A = 1.000 R-4370-17D Neenah Grate — Infiltration 0.2 inches/hr
Length = 100

Existing Conditions Sacramento SS Cross-Section

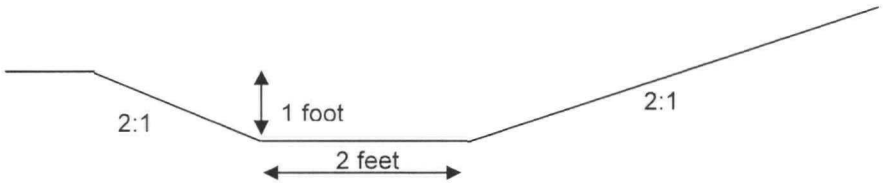


SideSlope 3
Area = 1.557 acres
Length = 1982 ft

Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Overflow Discharge* (cfs)	Infiltration Discharge	Total Discharge (cfs)	
593	0	0	0	0	0.00	0	0.06	0.00	No CB
593.5	0.5	0	1.5	2973	0.07	0	0.06	0.06	
594	1	0	4	7928	0.18	0	0.06	0.06	top of channel
594.1	1.1	0.1	4.62	9156.8	0.21	10	0.06	10.49	
594.2	1.2	0.2	5.28	10465	0.24	30	0.06	29.57	
594.3	1.3	0.3	5.98	11852	0.27	54	0.06	54.28	
594.4	1.4	0.4	6.72	13319	0.31	83	0.06	83.54	
594.5	1.5	0.5	7.5	14865	0.34	117	0.06	116.73	

*Overflow Discharge — CB - Orifice Flow
Weir flow — Q = 0.6*A*(sqrt(2*g*h)) — Top width 6 ft
Q = 3.3P(h)^1.5 — A = 1.000 R-4370-17D Neenah Grate — Infiltration 0.2 inches/hr
Length = 100

Existing Conditions Sacramento SS Cross-Section

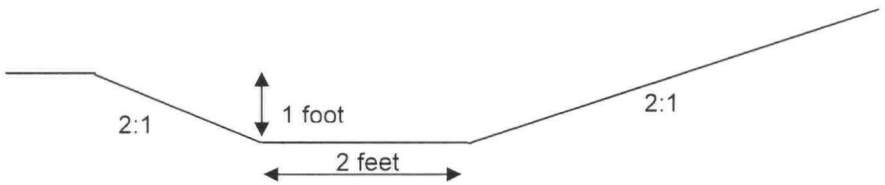


SideSlope 4
Area = 0.707 acres
Length = 916 ft

Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Overflow Discharge* (cfs)	Infiltration Discharge	Total Discharge (cfs)	
593	0	0	0	0	0.00	0	0.03	0.00	No CB
593.5	0.5	0	1.5	1374	0.03	0	0.03	0.03	
594	1	0	4	3664	0.08	0	0.03	0.03	top of channel
594.1	1.1	0.1	4.62	4231.9	0.10	10	0.03	10.46	
594.2	1.2	0.2	5.28	4836.5	0.11	30	0.03	29.54	
594.3	1.3	0.3	5.98	5477.7	0.13	54	0.03	54.25	
594.4	1.4	0.4	6.72	6155.5	0.14	83	0.03	83.51	
594.5	1.5	0.5	7.5	6870	0.16	117	0.03	116.70	

*Overflow Discharge — CB - Orifice Flow
Weir flow — Q = 0.6*A*(sqrt(2*g*h)) — Top width 6 ft
Q = 3.3P(h)^1.5 — A = 1.000 R-4370-17D Neenah Grate — Infiltration 0.2 inches/hr
Length = 100

Existing Conditions Sacramento SS Cross-Section



SideSlope 5
Area = 0.187 acres
Length = 250 ft

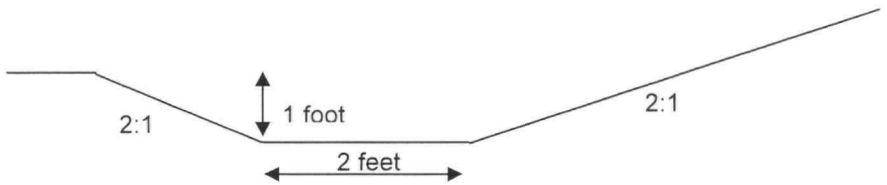
Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Overflow Discharge* (cfs)	Infiltration Discharge	Total Discharge (cfs)	
593	0	0	0	0	0.000	0	0.01	0.00	No CB
593.5	0.5	0	1.5	375	0.009	0	0.01	0.01	
594	1	0	4	1000	0.023	0	0.01	0.01	top of channel
594.1	1.1	0.1	4.62	1155	0.027	10	0.01	10.44	
594.2	1.2	0.2	5.28	1320	0.030	30	0.01	29.52	
594.3	1.3	0.3	5.98	1495	0.034	54	0.01	54.23	
594.4	1.4	0.4	6.72	1680	0.039	83	0.01	83.49	
594.5	1.5	0.5	7.5	1875	0.043	117	0.01	116.68	

*Overflow Discharge
Weir flow
Q = 3.3P(h)^1.5
Length = 100

CB - Orifice Flow
Q = 0.6*A*(sqrt(2*g*h))
A = 1.000 R-4370-17D Neenah Grate

Top width 6 ft
Infiltration 0.2 inches/hr

Existing Conditions Sacramento SS Cross-Section



SideSlope 1
Area = 0.257 acres
Length = 350 ft

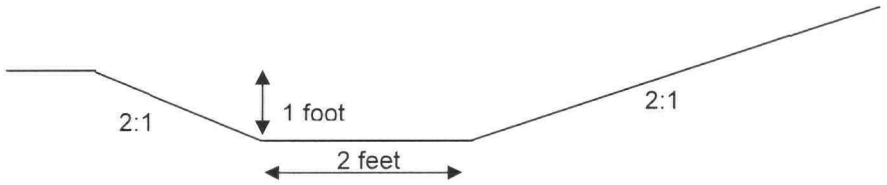
Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Overflow Discharge* (cfs)	Infiltration Discharge	Total Discharge (cfs)	
593	0	0	0	0	0.000	0	0.010	0.00	No CB
593.5	0.5	0	1.5	525	0.012	0	0.01	0.01	
594	1	0	4	1400	0.032	0	0.01	0.01	top of channel
594.1	1.1	0.1	4.62	1617	0.037	10	0.01	10.45	
594.2	1.2	0.2	5.28	1848	0.042	30	0.01	29.53	
594.3	1.3	0.3	5.98	2093	0.048	54	0.01	54.23	
594.4	1.4	0.4	6.72	2352	0.054	83	0.01	83.49	
594.5	1.5	0.5	7.5	2625	0.060	117	0.01	116.68	

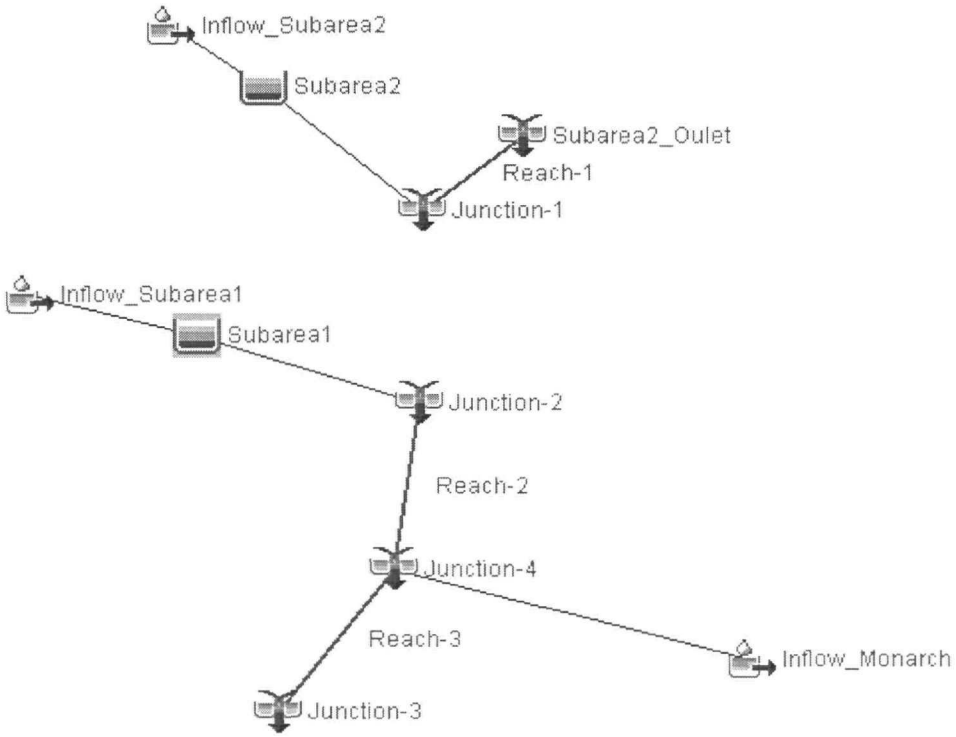
*Overflow Discharge
Weir flow
Q = 3.3P(h)^1.5
Length = 100

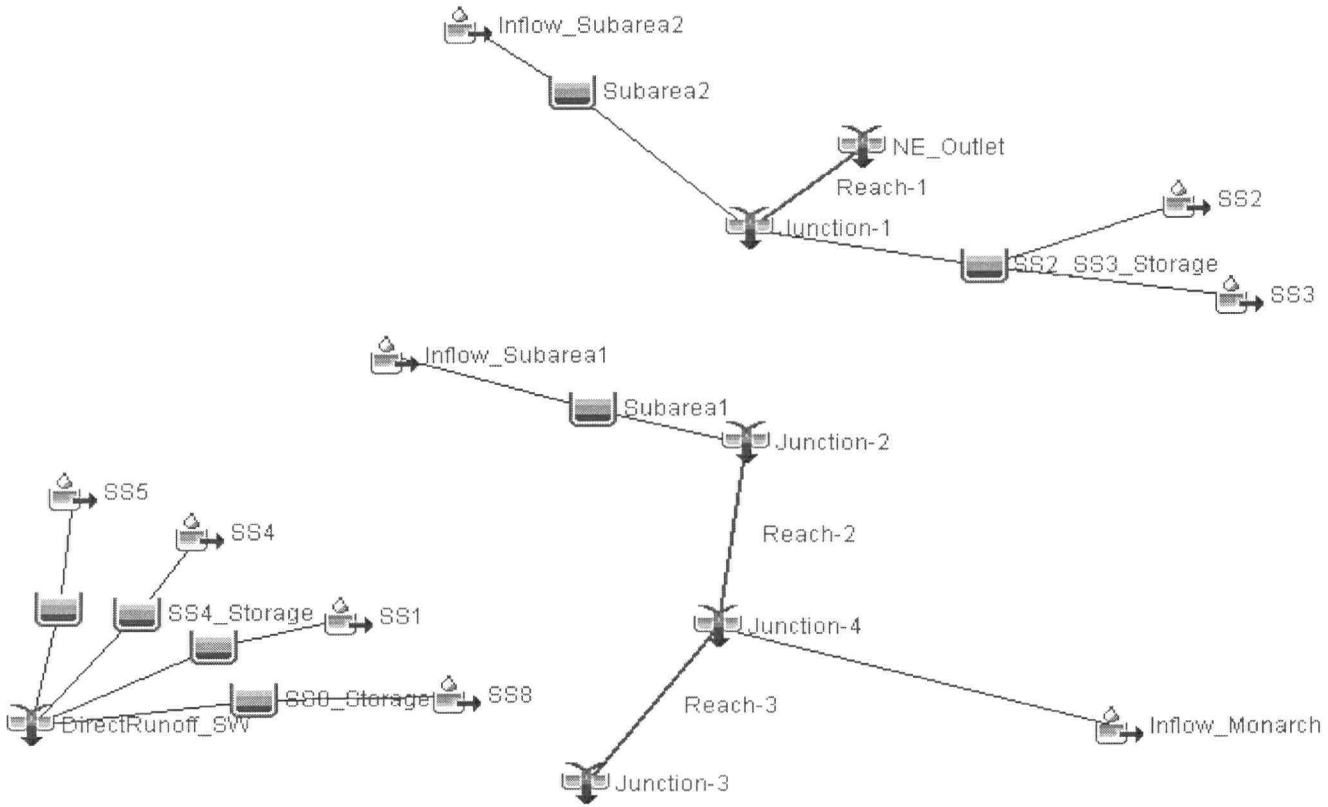
CB - Orifice Flow
Q = 0.6*A*(sqrt(2*g*h))
A = 1.000 R-4370-17D Neenah Grate

Top width 6 ft
Infiltration 0.2 inches/hr

Existing Conditions Sacramento SS Cross-Section




Inflow_Subarea2
Subarea2
Subarea2_Oulet
Reach-1
Junction-1
Inflow_Subarea1
Subarea1
Junction-2
Reach-2
Junction-4
Reach-3
Inflow_Monarch
Junction-3


Inflow_Subarea2
Subarea2
NE_Outlet
Reach-1
Junction-1
SS2
SS2_SS3_Storage
SS3
Inflow_Subarea1
Subarea1
Junction-2
SS5
SS4
Reach-2
SS4_Storage
SS1
Junction-4
SS8_Storage
SS8
DirectRunoff_SW
Reach-3
Inflow_Monarch
Junction-3

Stage, Storage Discharge Calculations

Area 1

Stage (ft)	Depth (ft)	Depth (ft)	Above Ground Storage (acre-ft)	Manhole Storage (acre-ft)	Total Storage (acre-ft)	Discharge CB (cfs)	Discharge CB - DOUBLE (cfs)	Discharge 8" Restrictor (cfs)	**Total Discharge 8" (cfs)**	Discharge 10" Restrictor (cfs)	**Total Dis - 10" (cfs)**	Discharge 9" Restrictor (cfs)	**Total Dis 9"** (cfs)	Discharge 6" Restrictor (cfs)	**Total Dis 6"** (cfs)
590.53	0	0	0	0.0000	0.0000	0	0	0.0	**0.0**	0.0	**0.0**	0.0	**0.0**	0.0	**0.0**
591.53	1	0	0	0.0003	0.0003	0	0	1.7	**1.7**	2.7	**2.7**	2.2	**2.2**	1.0	**1.0**
592.53	2	0	0	0.0006	0.0006	0	0	2.4	**2.4**	3.8	**3.8**	3.1	**3.1**	1.4	**1.4**
593.53	3	0	0	0.0009	0.0009	0	0	3.0	**3.0**	4.6	**4.6**	3.7	**3.7**	1.7	**1.7**
594.53	4	0	0	0.0012	0.0012	0	0	3.4	**3.4**	5.3	**5.3**	4.3	**4.3**	1.9	**1.9**
595.53	5	0	0	0.0014	0.0014	0	0	3.8	**3.8**	6.0	**6.0**	4.8	**4.8**	2.1	**2.1**
595.78	5.25	0	0	0.0015	0.0015	0	0	3.9	**3.9**	6.1	**6.1**	5.0	**5.0**	2.2	**2.2**
596.5	5.97	0.72	0.08	0.0015	0.0815	4.1	8.2	4.2	**4.10**	6.5	**6.52**	5.3	**5.28**	2.3	**2.35**
597	6.47	1.22	0.16	0.0015	0.1615	5.3	10.6	4.3	**4.35**	6.8	**6.79**	5.5	**5.50**	2.4	**2.44**
598	7.47	2.22	1.03	0.0015	1.0315	7.2	14.4	4.7	**4.67**	7.3	**7.30**	5.9	**5.91**	2.6	**2.63**
599	8.47	3.22	3.52	0.0015	3.5215	8.6	17.2	5.0	**4.97**	7.8	**7.77**	6.3	**6.29**	2.8	**2.80**

No additional MH storage above the rim elevation

Orifice = 0.6*A*SQRT(2*g*h)

Restrictor Diameter (inches)	Area (sf)
8	0.35
10	0.55
9	0.44
6	0.20

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-- Inlet Grate Capacities Menu --

Jump to: >HOME >BACK

Weir & Orifice Flow Comparison

$Q = 0.6A\sqrt{2gh}$
(Orifice Flow Equation)

Q = Capacity in CFS
A = Free open area of grate in sq. ft.
g = 32.2 (feet per sec/sec)
h = Head in feet

Orifice Information

Instructions:
- Either Select catalog number (will automatically fill in Open Area and Perimeter) or enter your own values
- Enter head value
- Press CALCULATE

The results will determine automatically if your situation falls into a Weir, Transitional or Orifice flow. Additionally, a pop-up window *will offer Neenah grates which fall* within the parameters chosen.

$Q = 3.3P(h)^{1.5}$
(Weir Equation)

Q = Capacity in CFS
P = Feet perimeter
h = Head in feet

Weir Information

Catalog number and grate type: R-4370-15 D

Head in feet (h): 0.72

Feet perimeter (P): 5.9

Calculate

Free open area in sq. ft. (A): 1.0

Weir capacity in cfs:

Transitional flow in cfs:

Orifice capacity in cfs: 4.1

(Results assume no debris restriction.)

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-- Inlet Grate Capacities Menu --

Jump to: >HOME >BACK

Weir & Orifice Flow Comparison

$Q = 0.6A\sqrt{2gh}$
(Orifice Flow Equation)

Q = Capacity in CFS
A = Free open area of grate in sq. ft.
g = 32.2 (feet per sec/sec)
h = Head in feet

Orifice Information

Instructions:
- Either Select catalog number (will automatically fill in Open Area and Perimeter) or enter your own values
- Enter head value
- Press CALCULATE

The results will determine automatically if your situation falls into a Weir, Transitional or Orifice flow. Additionally, a pop-up window will offer Neenah grates which fall within the parameters chosen.

$Q = 3.3P(h)^{1.5}$
(Weir Equation)

Q = Capacity in CFS
P = Feet perimeter
h = Head in feet

Weir Information

Catalog number and grate type: R-4370-15 D

Head in feet (h): 1.22

Feet perimeter (P): 5.9

Calculate

Free open area in sq. ft. (A): 1.0

Weir capacity in cfs:

Transitional flow in cfs:

Orifice capacity in cfs: 5.3

(Results assume no debris restriction.)

NEENAH FOUNDRY COMPANY 800-558-5075 FAX: 920-729-3661

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Weir & Orifice Flow Comparison

$Q = 0.6A\sqrt{2gh}$
(Orifice Flow Equation)

Q = Capacity in CFS
A = Free open area of grate in sq. ft.
g = 32.2 (feet per sec/sec)
h = Head in feet

Orifice Information

Instructions:
- Either Select catalog number (will automatically fill in Open Area and Perimeter) or enter your own values
- Enter head value
- Press CALCULATE

The results will determine automatically if your situation falls into a Weir, Transitional or Orifice flow. Additionally, a pop-up window will offer Neenah grates which fall within the parameters chosen.

$Q = 3.3P(h)^{1.5}$
(Weir Equation)

Q = Capacity in CFS
P = Feet perimeter
h = Head in feet

Weir Information

Catalog number and grate type: R-4370-15 D

Head in feet (h): 2.22

Feet perimeter (P): 5.9

Calculate

Free open area in sq. ft. (A): 1.0

Weir capacity in cfs:

Transitional flow in cfs:

Orifice capacity in cfs: 7.2

(Results assume no debris restriction.)

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Weir & Orifice Flow Comparison

$Q = 0.6A\sqrt{2gh}$
(Orifice Flow Equation)

Q = Capacity in CFS
A = Free open area of grate in sq. ft.
g = 32.2 (feet per sec/sec)
h = Head in feet

Orifice Information

Instructions:
- Either Select catalog number (will automatically fill in Open Area and Perimeter) or enter your own values
- Enter head value
- Press CALCULATE

The results will determine automatically if your situation falls into a Weir, Transitional or Orifice flow. Additionally, a pop-up window will offer Neenah grates which fall within the parameters chosen.

$Q = 3.3P(h)^{1.5}$
(Weir Equation)

Q = Capacity in CFS
P = Feet perimeter
h = Head in feet

Weir Information

Catalog number and grate type: R-4370-15 D

Head in feet (h): 3.22

Feet perimeter (P): 5.9

Calculate

Free open area in sq. ft. (A): 1.0

Weir capacity in cfs:

Transitional flow in cfs:

Orifice capacity in cfs: 3.6

(Results assume no debris restriction.)

Area 2

Stage (ft)	Depth (ft)	Depth (ft)	Storage (acre-ft)	Manhole Storage (acre-ft)	Total Storage (acre-ft)	Discharge CB (cfs)	Discharge 2.5" Restrictor (cfs)	**Total Discharge 2.5" (cfs)**	Discharge 4" Restrictor (cfs)	**Total Discharge 4" (cfs)**
592.48	0	0	0	0.0000	0.0000	0	0.00	**0.00**	0.00	**0.00**
593.48	1	0	0	0.0003	0.0003	0	0.17	**0.17**	0.43	**0.43**
594.48	2	0	0	0.0006	0.0006	0	0.24	**0.24**	0.60	**0.60**
595.48	3	0	0	0.0009	0.0009	0	0.29	**0.29**	0.74	**0.74**
596.48	4	0	0	0.0012	0.0012	0	0.33	**0.33**	0.85	**0.85**
597.23	4.75	0	0	0.0014	0.0014	0	0.36	**0.36**	0.93	**0.93**
598	5.52	0.77	0.01	0.0014	0.0114	4.2	0.39	**0.39**	1.00	**1.00**
599	6.52	1.77	0.24	0.0014	0.2414	6.4	0.43	**0.43**	1.09	**1.09**
600	7.52	2.77	1.17	0.0014	1.1714	8	0.46	**0.46**	1.17	**1.17**

No additional MH storage above the rim elevation

Orifice = 0.6*A*SQRT(2*g*h)

Restrictor Diameter (inches)	Area (sf)
2.5	0.03
4	0.09

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Weir Orifice Equation

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Weir & Orifice Flow Comparison

$Q = 0.6A\sqrt{2gh}$
(Orifice Flow Equation)

Q = Capacity in CFS
A = Free open area of grate in sq. ft.
g = 32.2 (feet per sec/sec)
h = Head in feet

Orifice Information

Instructions:

- Either Select catalog number (will automatically fill in Open Area and Perimeter) or enter your own values
- Enter head value
- Press CALCULATE

The results will determine automatically if your situation falls into a Weir, Transitional or Orifice flow. Additionally, a pop-up window will offer Neenah grates which fall within the parameters chosen.

$Q = 3.3P(h)^{1.5}$
(Weir Equation)

Q = Capacity in CFS
P = Feet perimeter
h = Head in feet

Weir Information

Catalog number and grate type: R-4370-17 D

Head in feet (h): 0.77

Feet perimeter (P): 6.0

Calculate

Free open area in sq. ft. (A): 1.0

Weir capacity in cfs:

Transitional flow in cfs:

Orifice capacity in cfs: 4.2

(Results assume no debris restriction.)

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Weir Orifice Equation

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Weir & Orifice Flow Comparison

$Q = 0.6A\sqrt{2gh}$
(Orifice Flow Equation)

Q = Capacity in CFS
A = Free open area of grate in sq. ft.
g = 32.2 (feet per sec/sec)
h = Head in feet

Orifice Information

Instructions:

- Either Select catalog number (will automatically fill in Open Area and Perimeter) or enter your own values
- Enter head value
- Press CALCULATE

The results will determine automatically if your situation falls into a Weir, Transitional or Orifice flow. Additionally, a pop-up window will offer Neenah grates which fall within the parameters chosen.

$Q = 3.3P(h)^{1.5}$
(Weir Equation)

Q = Capacity in CFS
P = Feet perimeter
h = Head in feet

Weir Information

Catalog number and grate type: R-4370-17 D

Head in feet (h): 2.77

Feet perimeter (P): 6.0

Calculate

Free open area in sq. ft. (A): 1.0

Weir capacity in cfs:

Transitional flow in cfs:

Orifice capacity in cfs: 8

(Results assume no debris restriction.)

NEENAH FOUNDRY COMPANY 800-558-5075 FAX: 920-729-3661

Weir Orifice Equation

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Weir & Orifice Flow Comparison

$Q = 0.6A\sqrt{2gh}$
(Orifice Flow Equation)

Q = Capacity in CFS
A = Free open area of grate in sq. ft.
g = 32.2 (feet per sec/sec)
h = Head in feet

Orifice Information

Instructions:

- Either Select catalog number (will automatically fill in Open Area and Perimeter) or enter your own values
- Enter head value
- Press CALCULATE

The results will determine automatically if your situation falls into a Weir, Transitional or Orifice flow. Additionally, a pop-up window will offer Neenah grates which fall within the parameters chosen.

$Q = 3.3P(h)^{1.5}$
(Weir Equation)

Q = Capacity in CFS
P = Feet perimeter
h = Head in feet

Weir Information

Catalog number and grate type: R-4370-17 D

Head in feet (h): 1.77

Feet perimeter (P): 6.0

Calculate

Free open area in sq. ft. (A): 1.0

Weir capacity in cfs:

Transitional flow in cfs:

Orifice capacity in cfs: 6.4

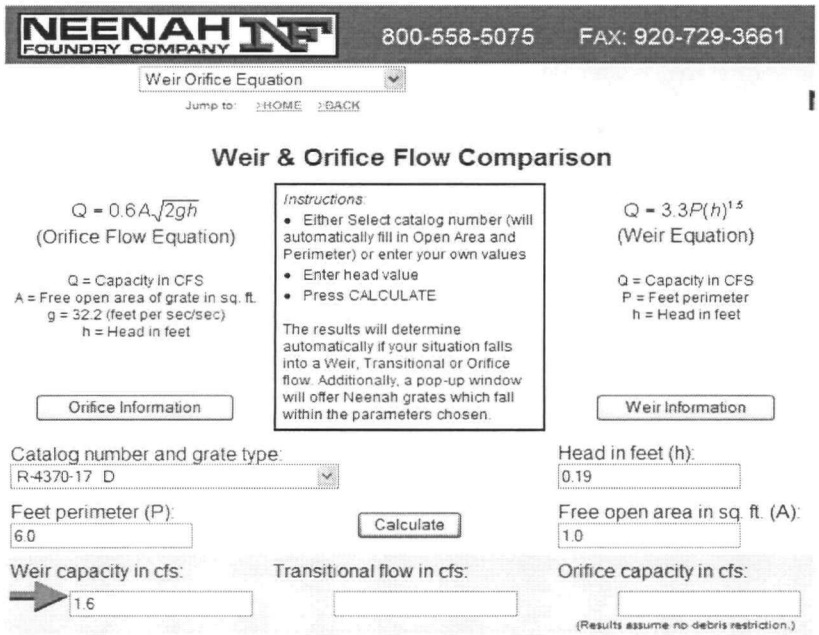
(Results assume no debris restriction.)

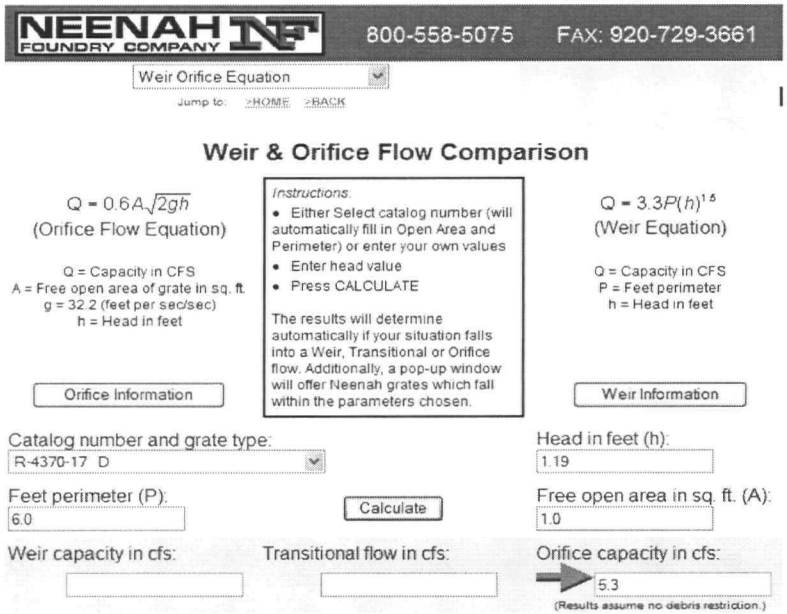
Monarch
Area = 1.6 acres

Stage (ft)	Depth (ft)	Depth (ft)	PP Storage (acre-ft)	Above Ground Storage (acre-ft)	Manhole Storage (acre-ft)	Total Storage w/ PP (acre-ft)	Total Storage w/ No PP (acre-ft)	Discharge CB (cfs)	Discharge Restrictor (cfs)	Total Discharge (cfs)	
589.22	0	0	0	0	0.0000	0.0000	0.0000	0	0	0	
590.22	1	0	0	0	0.0003	0.0003	0.0003	0	0.96	0.96	
591.22	2	0	0	0	0.0006	0.0006	0.0006	0	1.36	1.36	
592.31	3.09	0	0	0	0.0009	0.0009	0.0009	0	1.69	1.69	Bottom of Porous Pavement
593.31	4.09	0	0.48	0	0.0012	0.4812	0.0012	0	1.94	1.94	
594.31	5.09	0	0.96	0	0.0015	0.9615	0.0015	0	2.17	2.17	PP 6" thick
594.81	5.59	0	1.04	0	0.0015	1.0415	0.0015	0	2.27	2.27	CB Rim
595	5.78	0.19	1.04	0	0.0015	1.0415	0.0015	1.6	2.31	2.31	
596	6.78	1.19	1.04	0.34	0.0015	1.3815	0.3415	5.3	2.50	2.50	

No additional MH storage above the rim elevation

Orifice = 0.6*A*SQRT(2*g*h)
Restrictor Diameter = 6 inches
A = 0.196 ft^2





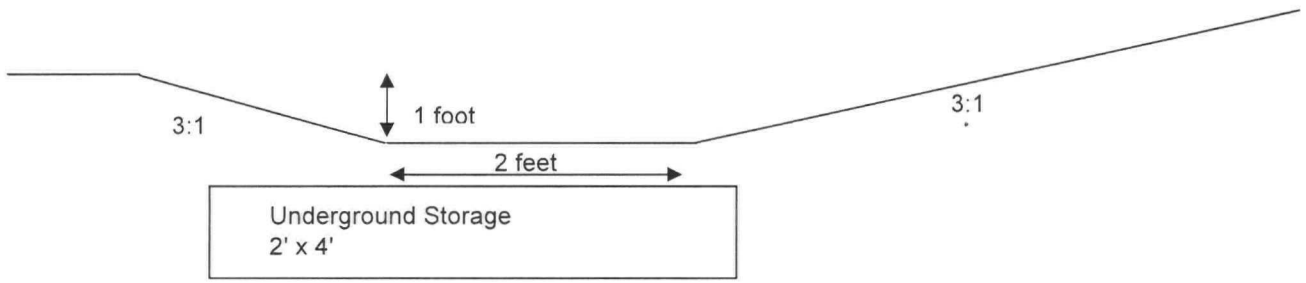
SideSlope 1
Area = 0.409 acres
Length = 665 ft

Stage (ft)	Depth (ft)	Overflow Depth (ft)	Underground Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Underground Storage (ft^3)	Underground Storage (acre-ft)	Total Storage (acre-ft)	Discharge CB (cfs)	Overflow Discharge* (cfs)	Infiltration Discharge (cfs)	Total Discharge (cfs)	
591	0	0	0	0	0	0	0	0.00	0.00	0.00	0	0.03	0	
592	0	0	1	0	0	0	798	0.02	0.02	0.00	0	0.03	0.03	
593	0	0	2	0	0	0.00	1596	0.04	0.04	0.00	0	0.03	0.03	No CB
593.5	0.5	0		1.75	1163.75	0.03	1596	0.04	0.06	3.40	0	0.03	0.03	
594	1	0		5	3325	0.08	1596	0.04	0.11	4.81	0	0.03	0.03	top of channel
594.1	1.1	0.1		5.83	3876.95	0.09	1596	0.04	0.13	5.05	10	0.03	10.47	
594.2	1.2	0.2		6.72	4468.8	0.10	1596	0.04	0.14	5.27	30	0.03	29.55	
594.3	1.3	0.3		7.67	5100.55	0.12	1596	0.04	0.15	5.49	54	0.03	54.26	
594.4	1.4	0.4		8.68	5772.2	0.13	1596	0.04	0.17	5.70	83	0.03	83.51	
594.5	1.5	0.5		9.75	6483.75	0.15	1596	0.04	0.19	5.90	117	0.03	116.70	

*Overflow Discharg CB - Orifice Flow
Weir flow Q = 0.6*A*(sqrt(2*g*h))
Q = 3.3P(h)^1.5 A = 1.000 R-4370-17D Neenah Grate
Length = 100

Top width 8 ft
Infiltration 0.25 inches/hr

Proposed Conditions Sacramento SS Cross-Section



SideSlope 1
Area = 0.409 acres
Length = 665 ft

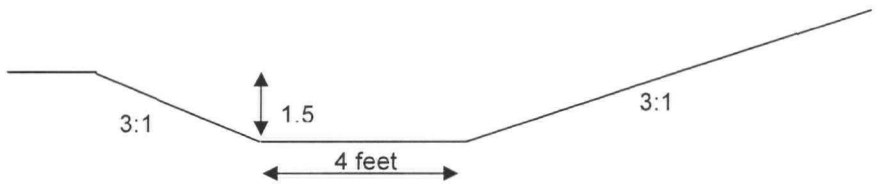
Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Overflow Discharge* (cfs)	Infiltration Discharge	Total Discharge	
593	0	0	0	0	0.00	0	0.05	0.00	No CB
593.5	0.5	0	2.75	1828.8	0.04	0	0.05	0.05	
594	1	0	7	4655	0.11	0	0.05	0.05	
594.5	1.5	0	12.75	8478.8	0.19	0	0.05	0.05	top of channel
594.6	1.6	0.1	14.08	9363.2	0.21	10	0.05	10.49	
594.7	1.7	0.2	15.47	10288	0.24	30	0.05	29.57	
594.8	1.8	0.3	16.92	11252	0.26	54	0.05	54.27	
594.9	1.9	0.4	18.43	12256	0.28	83	0.05	83.53	
595	2	0.5	20	13300	0.31	117	0.05	116.72	

*Overflow Discharge
Weir flow
Q = 3.3P(h)^1.5
Length = 100

CB - Orifice Flow
Q = 0.6*A*(sqrt(2*g*h))
A = 1.000 R-4370-17D Neenah Grate

Top width 13 ft
Infiltration 0.25 inches/hr

Proposed Conditions Sacramento SS Cross-Section



SideSlope 2

Area = 0.961 acres

Length = 1281 ft

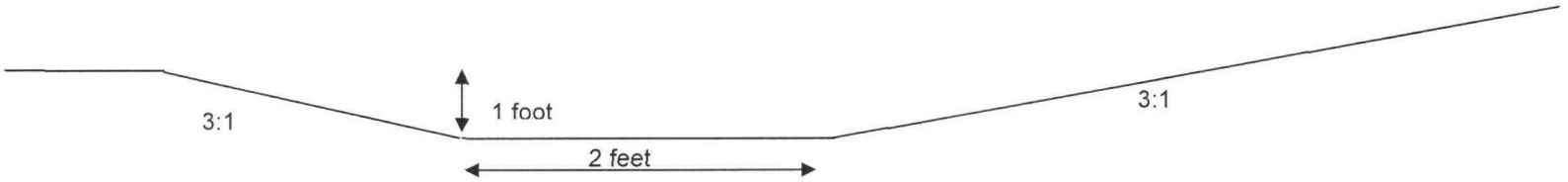
Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Discharge CB (cfs)	Overflow Discharge* (cfs)	Infiltration Discharge (cfs)	Total Discharge (cfs)		Total Discharge No CB (cfs)
593	0	0	0	0	0.00	0.00	0	0.06	0.06	CB on bott	0.06
593.5	0.5	0	1.75	2241.8	0.05	3.40	0	0.06	3.46		0.06
594	1	0	5	6405	0.15	4.81	0	0.06	4.87	top of chan	0.06
594.1	1.1	0.1	5.83	7468.2	0.17	5.05	10	0.06	15.54		10.49
594.2	1.2	0.2	6.72	8608.3	0.20	5.27	30	0.06	34.85		29.58
594.3	1.3	0.3	7.67	9825.3	0.23	5.49	54	0.06	59.77		54.28
594.4	1.4	0.4	8.68	11119	0.26	5.70	83	0.06	89.24		83.54
594.5	1.5	0.5	9.75	12490	0.29	5.90	117	0.06	122.63		116.73

*Overflow Discharge
Weir flow
Q = 3.3P(h)^1.5
Length = 100 Estimate

CB - Orifice Flow
Q = 0.6*A*(sqrt(2*g*h))
A = 1.000 R-4370-17D Neenah Grate

Top width 8 ft
Infiltration 0.25 inches/hr

Proposed Conditions Sacramento SS Cross-Section



SideSlope 3

Area = 0.596 acres

Length = 701 ft

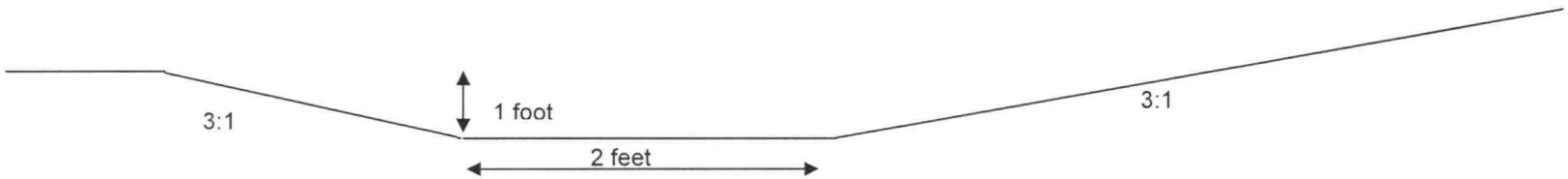
Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Discharge CB (cfs)	Overflow Discharge* (cfs)	Infiltration Discharge	Total Discharge (cfs)		Total Discharge No CB (cfs)
592	0	0	0	0	0.00	0.00	0	0.03	0.03	CB on bott	0.03
592.5	0.5	0	1.75	1226.8	0.03	3.40	0	0.03	3.44		0.03
593	1	0	5	3505	0.08	4.81	0	0.03	4.85	top of chan	0.03
593.1	1.1	0.1	5.83	4086.8	0.09	5.05	10	0.03	15.52		10.47
593.2	1.2	0.2	6.72	4710.7	0.11	5.27	30	0.03	34.82		29.55
593.3	1.3	0.3	7.67	5376.7	0.12	5.49	54	0.03	59.75		54.26
593.4	1.4	0.4	8.68	6084.7	0.14	5.70	83	0.03	89.21		83.52
593.5	1.5	0.5	9.75	6834.8	0.16	5.90	117	0.03	122.60		116.71

*Overflow Discharge
Weir flow
Q = 3.3P(h)^1.5
Length = 100

CB - Orifice Flow
Q = 0.6*A*(sqrt(2*g*h))
A = 1.000 R-4370-17D Neenah Grate

Top width 8 ft
Infiltration 0.25 inches/hr

Proposed Conditions Sacramento SS Cross-Section



SideSlope 2 and 3
Area = 1.557 acres
Length = 1982 ft

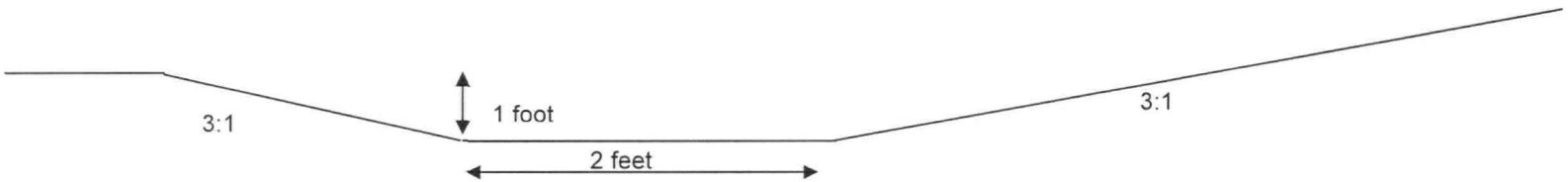
Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Overflow Discharge * (cfs)	Infiltration Discharge	Total Discharge (cfs)	
593	0	0	0	0	0.00	0	0.09	0.00	No Catch Basin
593.5	0.5	0	1.75	3468.5	0.08	0	0.09	0.09	
594	1	0	5	9910	0.23	0	0.09	0.09	top of channel
594.1	1.1	0.1	5.83	11555	0.27	10	0.09	10.53	
594.2	1.2	0.2	6.72	13319	0.31	30	0.09	29.61	
594.3	1.3	0.3	7.67	15202	0.35	54	0.09	54.32	
594.4	1.4	0.4	8.68	17204	0.39	83	0.09	83.58	
594.5	1.5	0.5	9.75	19325	0.44	117	0.09	116.76	

*Overflow Discharge
Weir flow
Q = 3.3P(h)^1.5
Length = 100 Estimate

CB - Orifice Flow
Q = 0.6*A*(sqrt(2*g*h))
A = 1.000 R-4370-17D Neenah Grate

Top width 8 ft
Infiltration 0.25 inches/hr

Proposed Conditions Sacramento SS Cross-Section



SideSlope 4
Area = 0.707 acres
Length = 916 ft

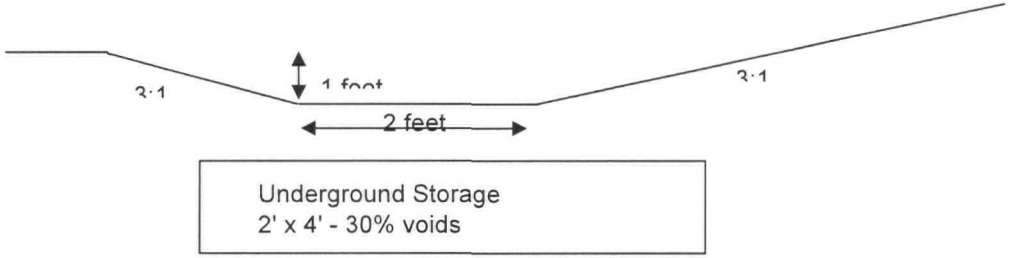
Stage (ft)	Depth (ft)	Overflow Depth (ft)	Underground Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Underground Storage (ft^3)	Underground Storage (acre-ft)	Total Storage (acre-ft)	Overflow Discharge* (cfs)	**Total Dis - 6" (cfs)**	Infiltration Discharge (cfs)	Total Discharge (cfs)	No CB (cfs)	
591			0	0	0	0.00	0	0.00	0.00	0	**0**	0.04	0	0	
592			1	0	0	0.00	1099.2	0.03	0.03	0	**0**	0.04	0.04	0.04	
593	0	0	2	0	0	0.00	2198.4	0.05	0.05	0	0.00	0.04	0.04	0.04	No CB
593.5	0.5	0		1.75	1603	0.04	2198.4	0.05	0.09	0	0.68	0.04	0.72	0.04	
594	1	0		5	4580	0.11	2198.4	0.05	0.16	0	0.96	0.04	1.00	0.04	Top Chann
594.1	1.1	0.1		5.83	5340.28	0.12	2198.4	0.05	0.17	10	1.01	0.04	11.49	10.48	
594.2	1.2	0.2		6.72	6155.52	0.14	2198.4	0.05	0.19	30	1.05	0.04	30.61	29.56	
594.3	1.3	0.3		7.67	7025.72	0.16	2198.4	0.05	0.21	54	1.10	0.04	55.36	54.27	
594.4	1.4	0.4		8.68	7950.88	0.18	2198.4	0.05	0.23	83	1.14	0.04	84.66	83.53	
594.5	1.5	0.5		9.75	8931	0.21	2198.4	0.05	0.26	117	1.18	0.04	117.89	116.72	

*Overflow Discharg CB - Orifice Flow
Weir flow Q = 0.6*A*(sqrt(2*g*h))
Q = 3.3P(h)^1.5 A = 1.000 R-4370-17D Neenah Grate
Length = 100

Top width 8 ft
Infiltration 0.25 inches/hr

Proposed Conditions Sacramento SS Cross-Section

Orifice =
Restrictor Diameter (inches) 6
Area (sf) 0.20



SideSlope 5
Area = 0.187 acres
Length = 250 ft

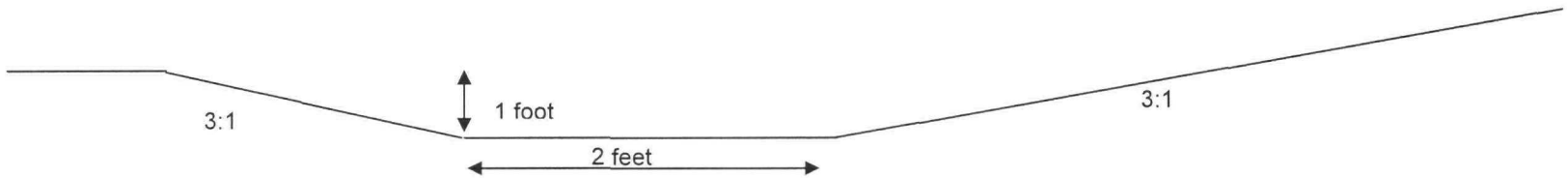
Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Discharge CB (cfs)	Overflow Discharge* (cfs)	Infiltration Discharge (cfs)	Total Discharge (cfs)		No CB Discharge (cfs)
593	0	0	0	0	0.00	0.00	0	0.01	0.01	CB on bott	0.012
593.5	0.5	0	1.75	437.5	0.01	3.40	0	0.01	3.42		0.012
594	1	0	5	1250	0.03	4.81	0	0.01	4.83	top of chan	0.012
594.1	1.1	0.1	5.83	1457.5	0.03	5.05	10	0.01	15.50		10.447
594.2	1.2	0.2	6.72	1680	0.04	5.27	30	0.01	34.80		29.528
594.3	1.3	0.3	7.67	1917.5	0.04	5.49	54	0.01	59.73		54.236
594.4	1.4	0.4	8.68	2170	0.05	5.70	83	0.01	89.19		83.496
594.5	1.5	0.5	9.75	2437.5	0.06	5.90	117	0.01	122.58		116.684

*Overflow Discharge
Weir flow
Q = 3.3P(h)^1.5
Length = 100

CB - Orifice Flow
Q = 0.6*A*(sqrt(2*g*h))
A = 1.000 R-4370-17D Neenah Grate

Top width 8 ft
Infiltration 0.25 inches/hr

Proposed Conditions Sacramento SS Cross-Section



SideSlope 6
Area = 0.257 acres
Length = 412 ft

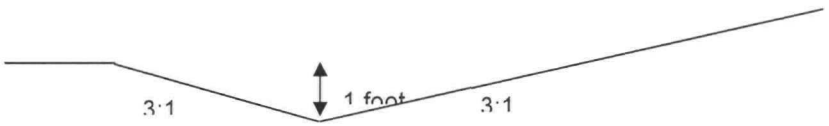
Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Discharge CB (cfs)	Overflow Discharge* (cfs)	Infiltration Discharge	Total Discharge (cfs)		No CB Discharge (cfs)
592	0	0	0	0	0.000	0.00	0	0.01	0.01	CB on bott	0.014
592.5	0.5	0	0.375	154.5	0.004	3.40	0	0.01	3.42		0.014
593	1	0	1.5	618	0.014	4.81	0	0.01	4.83	top of chan	0.014
593.1	1.1	0.1	1.815	747.78	0.017	5.05	10	0.01	15.50		10.450
593.2	1.2	0.2	2.16	889.92	0.020	5.27	30	0.01	34.80		29.530
593.3	1.3	0.3	2.535	1044.4	0.024	5.49	54	0.01	59.73		54.239
593.4	1.4	0.4	2.94	1211.3	0.028	5.70	83	0.01	89.20		83.498
593.5	1.5	0.5	3.375	1390.5	0.032	5.90	117	0.01	122.58		116.687

*Overflow Discharge
Weir flow
Q = 3.3P(h)^1.5
Length = 100

CB - Orifice Flow
Q = 0.6*A*(sqrt(2*g*h))
A = 1.000 R-4370-17D Neenah Grate

Top width 6 ft
Infiltration 0.25 inches/hr

Proposed Conditions Monarch SS Cross-Section



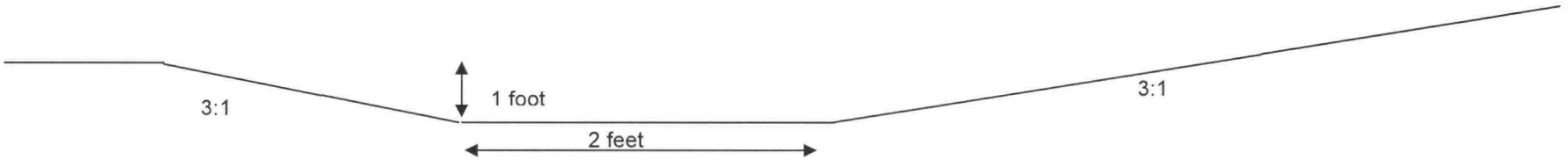
SideSlope 5 and 6
Area = 0.187 acres
Length = 250 ft

Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area Sacramento (ft^2)	XS Area Monarch (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Overflow Discharge* (cfs)	Infiltration Discharge	Total Discharge (cfs)	
593	0	0	0	0	0	0.000	0	0.03	0.00	No CB
593.5	0.5	0	1.75	0.375	531.25	0.012	0	0.03	0.03	
594	1	0	5	1.5	1625	0.037	0	0.03	0.03	top of channel
594.1	1.1	0.1	5.83	1.815	1911.3	0.044	10	0.03	10.46	
594.2	1.2	0.2	6.72	2.16	2220	0.051	30	0.03	29.54	
594.3	1.3	0.3	7.67	2.535	2551.2	0.059	54	0.03	54.25	
594.4	1.4	0.4	8.68	2.94	2905	0.067	83	0.03	83.51	
594.5	1.5	0.5	9.75	3.375	3281.3	0.075	117	0.03	116.70	

*Overflow Discharge
Weir flow
Q = 3.3P(h)^1.5
Length = 100

CB - Orifice Flow
Q = 0.6*A*(sqrt(2*g*h))
A = 1.000 R-4370-17D Neenah Grate

Proposed Conditions Sacramento SS Cross-Section



Proposed Conditions Monarch SS Cross-Section

SideSlope 7
Area = 0.129 acres
Length = 320 ft

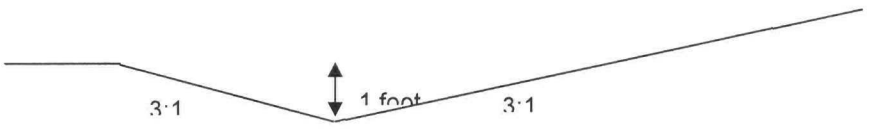
Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Discharge CB (cfs)	Overflow Discharge* (cfs)	Infiltration Discharge	Total Discharge (cfs)		No CB Discharge (cfs)
593	0	0	0	0	0.000	0.00	0	0.01	0.01	CB on bott	0.011
593.5	0.5	0	0.375	120	0.003	3.40	0	0.01	3.42		0.011
594	1	0	1.5	480	0.011	4.81	0	0.01	4.83	top of chan	0.011
594.1	1.1	0.1	1.815	580.8	0.013	5.05	1	0.01	6.10		1.055
594.2	1.2	0.2	2.16	691.2	0.016	5.27	3	0.01	8.24		2.963
594.3	1.3	0.3	2.535	811.2	0.019	5.49	5	0.01	10.92		5.434
594.4	1.4	0.4	2.94	940.8	0.022	5.70	8	0.01	14.06		8.360
594.5	1.5	0.5	3.375	1080	0.025	5.90	12	0.01	17.58		11.678

*Overflow Discharge
Weir flow
Q = 3.3P(h)^1.5
Length = 10

CB - Orifice Flow
Q = 0.6*A*(sqrt(2*g*h))
A = 1.000 R-4370-17D Neenah Grate

Top width 6 ft
Infiltration 0.25 inches/hr

Proposed Conditions Monarch SS Cross-Section



SideSlope 1
Area = 0.257 acres
Length = 350 ft

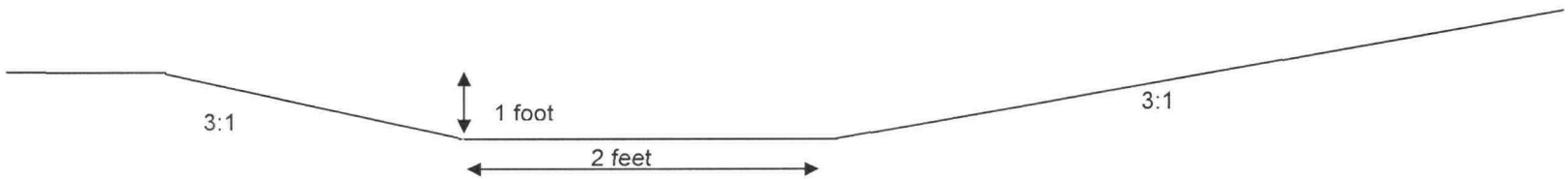
Stage (ft)	Depth (ft)	Overflow Depth (ft)	XS Area (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Discharge CB (cfs)	Overflow Discharge* (cfs)	Infiltration Discharge	Total Discharge (cfs)		No CB Discharge (cfs)
593	0	0	0	0	0.000	0.00	0	0.02	0.02	CB on bott	0.016
593.5	0.5	0	1.75	612.5	0.014	3.40	0	0.02	3.42		0.016
594	1	0	5	1750	0.040	4.81	0	0.02	4.83	top of chan	0.016
594.1	1.1	0.1	5.83	2040.5	0.047	5.05	1	0.02	6.11		1.060
594.2	1.2	0.2	6.72	2352	0.054	5.27	3	0.02	8.24		2.968
594.3	1.3	0.3	7.67	2684.5	0.062	5.49	5	0.02	10.93		5.439
594.4	1.4	0.4	8.68	3038	0.070	5.70	8	0.02	14.06		8.365
594.5	1.5	0.5	9.75	3412.5	0.078	5.90	12	0.02	17.58		11.683

*Overflow Discharge
Weir flow
Q = 3.3P(h)^1.5
Length = 10

CB - Orifice Flow
Q = 0.6*A*(sqrt(2*g*h))
A = 1.000 R-4370-17D Neenah Grate

Top width 8 ft
Infiltration 0.25 inches/hr

Proposed Conditions Sacramento SS Cross-Section



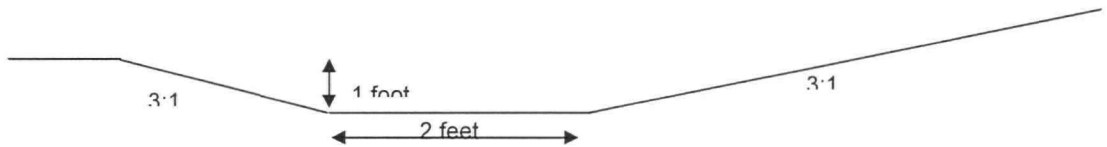
SideSlope 7 and 8
Area = 0.386 acres
Length = 670 ft

Stage (ft)	Depth (ft)	Overflow Depth (ft)	Underground Depth (ft)	XS Area Sacramento (ft^2)	XS Area Monarch (ft^2)	Above Ground Storage (ft^3)	Above Ground Storage (acre-ft)	Underground Storage (ft^3)	Underground Storage (acre-ft)	Total Storage (acre-ft)	Overflow Discharge* (cfs)	Infiltration Discharge (cfs)	Total Discharge (cfs)	No CB Discharge (cfs)	
591	0	0	0	0	0	0	0	0	0.00	0.00	0	0.03	0	0	
592	0	0	1	0	0	0	0	804	0.02	0.02	0	0.03	0.03	0.027	
593	0	0	2	0	0	0	0.000	1608	0.04	0.04	0	0.03	0.03	0.027	No CB
593.5	0.5	0		1.75	0.375	1423.75	0.033	1608	0.04	0.07	0	0.03	0.71	0.027	
594	1	0		5	1.5	4355	0.100	1608	0.04	0.14	0	0.03	0.99	0.027	Top Channel
594.1	1.1	0.1		5.83	1.815	5122.15	0.118	1608	0.04	0.15	10	0.03	11.47	10.463	
594.2	1.2	0.2		6.72	2.16	5949.6	0.137	1608	0.04	0.17	30	0.03	30.60	29.543	
594.3	1.3	0.3		7.67	2.535	6837.35	0.157	1608	0.04	0.19	54	0.03	55.35	54.252	
594.4	1.4	0.4		8.68	2.94	7785.4	0.179	1608	0.04	0.22	83	0.03	84.65	83.511	
594.5	1.5	0.5		9.75	3.375	8793.75	0.202	1608	0.04	0.24	116.7	0.03	117.88	116.700	

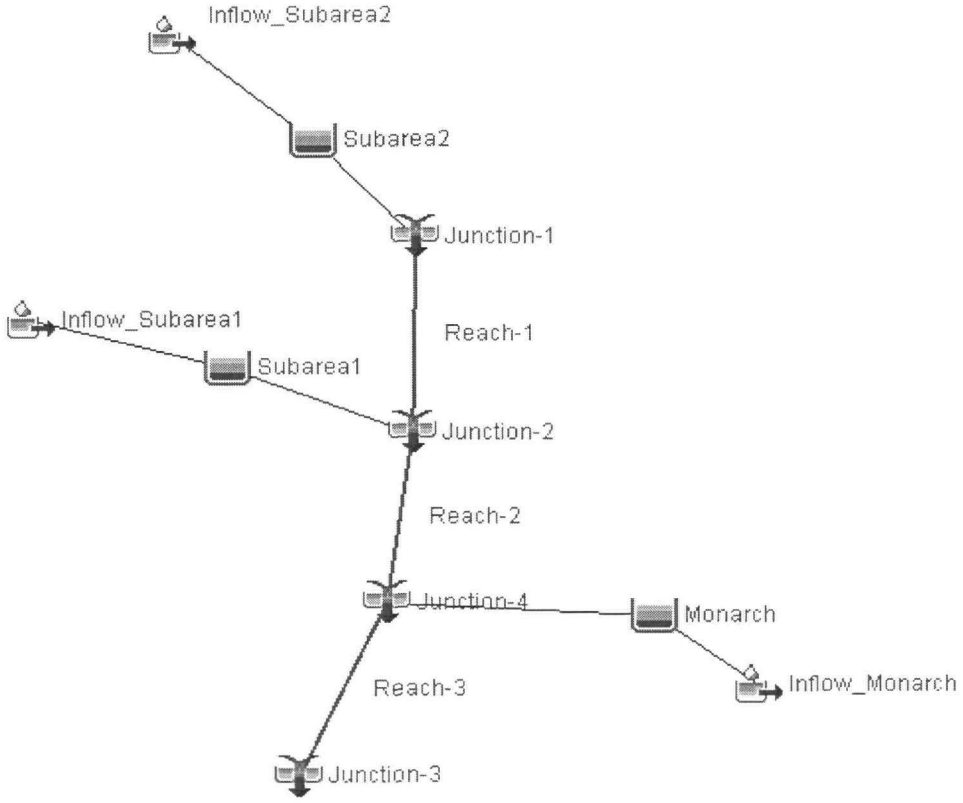
*Overflow Discharge CB - Orifice Flow
Weir flow Q = 0.6*A*(sqrt(2*g*h))
Q = 3.3P(h)^1.5 A = 1.000 R-4370-17D Neenah Grate Orifice = 0.6*A*SQRT(2*g*h)
Length = 100

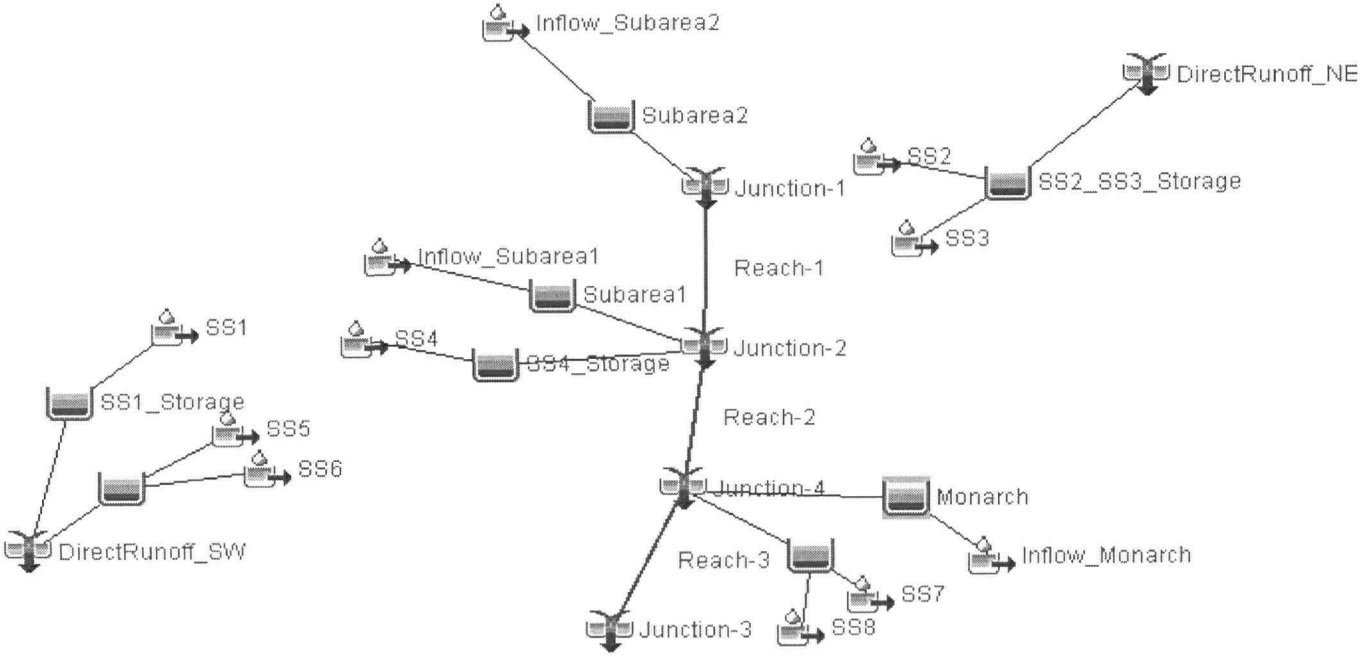
Restrictor	Area (sf)
6	0.20

Proposed Conditions Sacramento SS Cross-Section



Proposed Conditions Monarch SS Cross-Section


Inflow_Subarea2
Subarea2
Junction-1
Inflow_Subarea1
Reach-1
Subarea1
Junction-2
Reach-2
Junction-4
Monarch
Inflow_Monarch
Reach-3
Junction-3


Inflow_Subarea2
Subarea2
DirectRunoff_NE
SS2
SS2_SS3_Storage
Junction-1
SS3
Inflow_Subarea1
Reach-1
Subarea1
SS1
SS4
SS4_Storage
Junction-2
SS1_Storage
Reach-2
SS5
SS6
Junction-4
Monarch
Inflow_Monarch
DirectRunoff_SW
Reach-3
SS7
Junction-3
SS8

Pipe Design Calculations

Title: Pipe designs for Honeywell Celotex

By: Mark Mittag/MKE

Date: August 12, 2008

Project: Honeywell Celotex

green cells are different than shown on drawings

Structure	RIM (ft.)	Depth of Cover (ft.)	Upstream invert (ft.)	Downstream invert (ft.)	Pipe length (ft.)	Slope (ft./ft.)	Manning's n	Pipe size (in.)	Pipe area (ft.^2)	Top of Pipe (ft.)	Design flow (cfs)	Velocity (ft./s.)	Calculated flow (cfs)	
CB-4	597.43	1.60	594.83	593.77	330	0.0032	0.012	12	0.79	594.97	1.1	2.79	2.19	Class IV
MH-6	599.90	5.23	593.67	592.62	330	0.0032	0.012	12	0.79	593.82	1.1	2.79	2.19	ESVCP
MH-5	600.50	6.98	592.52	591.46	330	0.0032	0.012	12	0.79	592.66	1.1	2.79	2.19	ESVCP
MH-4	597.83	5.47	591.36	590.32	231	0.0045	0.012	12	0.79	591.52	1.1	3.31	2.60	ESVCP
CB-7	592.35	1.60	589.75	589.16	185	0.0032	0.012	12	0.79	590.36	1.1	2.79	2.19	Class IV
CB-6	593.58	3.52	589.06	588.35	221	0.0032	0.012	12	0.79	589.55	1.1	2.79	2.19	Class IV
CB-3	595.78	3.72	590.56	590.53	10	0.0035	0.012	18	1.77	592.23	3.5	3.82	6.75	ESVCP
CB-2	595.78	3.76	590.53	590.34	10	0.0190	0.012	18	1.77	592.04	7	8.90	15.73	ESVCP
MH-3	596.06	5.96	588.35	587.49	245	0.0035	0.012	21	2.41	589.44	8.1	4.23	10.18	Class IV
CB-1	594.81	4.59	589.22	589.10	10	0.0120	0.012	12	0.79	590.30	4.1	5.40	4.24	ESVCP
MH-2	594.88	5.64	587.49	586.17	204	0.0065	0.012	21	2.41	588.12	12.2	5.77	13.88	Class IV
CB-5	591.40	3.10	587.30	586.64	55	0.0120	0.012	12	0.79	587.84	1.1	5.40	4.24	ESVCP
MH-1A	596.89	8.97	586.17	585.48	105	0.0065	0.012	21	2.41	587.43	12.2	5.77	13.88	Class IV
MH-1	593.00	8.77	582.48	580.76	50	0.0344	0.012	21	2.41	582.71	12.2	13.27	31.92	Class IV
					2316									

desgin flow = half overall flow

Length (ft)	Size (in)	Pipe Material	# Manholes	# CBs	# Connections
736	12	Class IV RCCP	7	7	1
956	12	ESCVP			
20	18	ESCVP			
604	21	Class IV RCCP			
2316					

Time of Concentration Calculations

Time of Concentration & Travel Time Worksheet

Note: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments

Sheet Flow (Applicable to T_c only)		**Segment ID**						
1.) Surface Description (use code A-J, table 3-1)				A				
2.) Manning's roughness coeff., n (table 3-1)				0.011		0		
3.) Flow length, L (total L <= 300 ft)			*ft*	300				
4.) Two-yr 24-hr rainfall, P_2	(Sioux Falls IDF)		*in*	3.04		2.688		
5.) Land Slope, s			*ft/ft*	0.0077				
6.) $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\, s^{0.4}}$	Compute T_t		*hr*	0.073093054	+	0	=	0.073093
Shallow concentrated flow		**Segment ID**						
7.) Surface description (P=paved or U=unpaved)				U				
8.) Flow length, L			*ft*	480				
9.) Watercourse slope, s			*ft/ft*	0.0077				
10.) Average velocity, v (figure 3-1)			*ft/s*	1.415796629				
11.) $T_t = \frac{L}{3600\ v}$	Compute T_t		*hr*	0.094175484	+	0	=	0.094175
Channel Flow (trapezoidal channel)		**Segment ID**						
12a.) Ditch side slope 1								
12b.) Ditch side slope 2								
12c.) Bottom width			*ft*					
12d.) Depth of flow			*ft*					
12.) Cross sectional flow area, a			ft^2	0		0		
13.) Wetted Perimeter, P_w			*ft*	0		0		
14.) Hydraulic Radius, r = a/P_w	Compute r		*ft*	0		0		
15.) Channel Slope, s			*ft/ft*					
16.) Manning's roughness coeff., n								
17.) $v = \frac{1.49 r^{2/3} s^{1/2}}{n}$	Compute v		*ft/s*	0		0		
18.) Flow Length, L			*ft*					
19.) $T_t = \frac{L}{3600\ v}$	Compute T_t		*hr*	0	+	0	=	0
20.) Watershed or subarea T_c or T_t (add T_t in steps 6, 11, 19)							*hr*	0.167269
							min	10

(210-VI-TR-55, Second Ed., June 1986)

Time of Concentration & Travel Time Worksheet

Note: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments

Sheet Flow (Applicable to T_c only)		**Segment ID**				
1.) Surface Description (use code A-J, table 3-1)			A			
2.) Manning's roughness coeff., n (table 3-1)			0.011	0		
3.) Flow length, L (total L <= 300 ft)		*ft*	300			
4.) Two-yr 24-hr rainfall, P_2	(Sioux Falls IDF)	*in*	3.04	2.688		
5.) Land Slope, s		*ft/ft*	0.0064			
6.) $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	Compute T_t	*hr*	0.078704653	+ 0	=	0.078705

Shallow concentrated flow		**Segment ID**				
7.) Surface description (P=paved or U=unpaved)			U			
8.) Flow length, L		*ft*	250			
9.) Watercourse slope, s		*ft/ft*	0.0064			
10.) Average velocity, v (figure 3-1)		*ft/s*	1.29076			
11.) $T_t = \frac{L}{3600\,v}$	Compute T_t	*hr*	0.053801206	+ 0	=	0.053801

Channel Flow (trapezoidal channel)		**Segment ID**				
12a.) Ditch side slope 1						
12b.) Ditch side slope 2						
12c.) Bottom width		*ft*				
12d.) Depth of flow		*ft*				
12.) Cross sectional flow area, a		ft^2	0	0		
13.) Wetted Perimeter, P_w		*ft*	0	0		
14.) Hydraulic Radius, r = a/P_w	Compute r	*ft*	0	0		
15.) Channel Slope, s		*ft/ft*				
16.) Manning's roughness coeff., n						
17.) $v = \frac{1.49 r^{2/3} s^{1/2}}{n}$	Compute v	*ft/s*	0	0		
18.) Flow Length, L		*ft*				
19.) $T_t = \frac{L}{3600\,v}$	Compute T_t	*hr*	0	+ 0	=	0

20.) Watershed or subarea T_c or T_t (add T_t in steps 6, 11, 19)

hr	0.132506
min	8

(210-VI-TR-55, Second Ed., June 1986)

Time of Concentration & Travel Time Worksheet

Note: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments

Sheet Flow (Applicable to T_c only)		**Segment ID**				
1.) Surface Description (use code A-J, table 3-1)			A			
2.) Manning's roughness coeff., n (table 3-1)			0.011	0		
3.) Flow length, L (total L <= 300 ft)		ft	230			
4.) Two-yr 24-hr rainfall, P_2	(Sioux Falls IDF)	in	3.04	2.688		
5.) Land Slope, s		ft/ft	0.0077			
6.) $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	Compute T_t	hr	0.059096448	+ 0	=	0.059096

Shallow concentrated flow		**Segment ID**				
7.) Surface description (P=paved or U=unpaved)						
8.) Flow length, L		ft				
9.) Watercourse slope, s		ft/ft				
10.) Average velocity, v (figure 3-1)		ft/s				
11.) $T_t = \frac{L}{3600\,v}$	Compute T_t	hr	0	+ 0	=	0

Channel Flow (trapezoidal channel)		**Segment ID**				
12a.) Ditch side slope 1						
12b.) Ditch side slope 2						
12c.) Bottom width		ft				
12d.) Depth of flow		ft				
12.) Cross sectional flow area, a		ft^2	0	0		
13.) Wetted Perimeter, P_w		ft	0	0		
14.) Hydraulic Radius, r = a/P_w	Compute r	ft	0	0		
15.) Channel Slope, s		ft/ft				
16.) Manning's roughness coeff., n						
17.) $v = \frac{1.49 r^{2/3} s^{1/2}}{n}$	Compute v	ft/s	0	0		
18.) Flow Length, L		ft				
19.) $T_t = \frac{L}{3600\,v}$	Compute T_t	hr	0	+ 0	=	0

20.) Watershed or subarea T_c or T_t (add T_t in steps 6, 11, 19) hr 0.059096

min 4

(210-VI-TR-55, Second Ed., June 1986)

Time of Concentration & Travel Time Worksheet

Note: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments

Sheet Flow (Applicable to T_c only)		**Segment ID**				
1.) Surface Description (use code A-J, table 3-1)			E			
2.) Manning's roughness coeff., n (table 3-1)			0.15	0		
3.) Flow length, L (total L <= 300 ft)		*ft*	300			
4.) Two-yr 24-hr rainfall, P_2	(Sioux Falls IDF)	*in*	3.04	2.688		
5.) Land Slope, s		*ft/ft*	0.0077			
6.) $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	Compute T_t	*hr*	0.591064627	+ 0	=	0.591065

Shallow concentrated flow		**Segment ID**				
7.) Surface description (P=paved or U=unpaved)			U			
8.) Flow length, L		*ft*	480			
9.) Watercourse slope, s		*ft/ft*	0.0077			
10.) Average velocity, v (figure 3-1)		*ft/s*	1.415796629			
11.) $T_t = \frac{L}{3600\,v}$	Compute T_t	*hr*	0.094175484	+ 0	=	0.094175

Channel Flow (trapezoidal channel)		**Segment ID**				
12a.) Ditch side slope 1						
12b.) Ditch side slope 2						
12c.) Bottom width		*ft*				
12d.) Depth of flow		*ft*				
12.) Cross sectional flow area, a		ft^2	0	0		
13.) Wetted Perimeter, P_w		*ft*	0	0		
14.) Hydraulic Radius, r = a/P_w	Compute r	*ft*	0	0		
15.) Channel Slope, s		*ft/ft*				
16.) Manning's roughness coeff., n						
17.) $v = \frac{1.49 r^{2/3} s^{1/2}}{n}$	Compute v	*ft/s*	0	0		
18.) Flow Length, L		*ft*				
19.) $T_t = \frac{L}{3600\,v}$	Compute T_t	*hr*	0	+ 0	=	0

20.) Watershed or subarea T_c or T_t (add T_t in steps 6, 11, 19) ***hr*** 0.68524

min 41

(210-VI-TR-55, Second Ed., June 1986)

Time of Concentration & Travel Time Worksheet

Note: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments

Sheet Flow (Applicable to T_c only)			**Segment ID**					
1.) Surface Description (use code A-J, table 3-1)					E			
2.) Manning's roughness coeff., n (table 3-1)					0.15	0		
3.) Flow length, L (total L <= 300 ft)				ft	300			
4.) Two-yr 24-hr rainfall, P_2	(Sioux Falls IDF)			in	3.04	2.688		
5.) Land Slope, s				ft/ft	0.0064			
6.) $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$		Compute T_t		hr	0.636442642	+ 0	=	0.636443
Shallow concentrated flow			**Segment ID**					
7.) Surface description (P=paved or U=unpaved)					U			
8.) Flow length, L				ft	250			
9.) Watercourse slope, s				ft/ft	0.0064			
10.) Average velocity, v (figure 3-1)				ft/s	1.29076			
11.) $T_t = \frac{L}{3600\,v}$		Compute T_t		hr	0.053801206	+ 0	=	0.053801
Channel Flow (trapezoidal channel)			**Segment ID**					
12a.) Ditch side slope 1								
12b.) Ditch side slope 2								
12c.) Bottom width				ft				
12d.) Depth of flow				ft				
12.) Cross sectional flow area, a				ft^2	0	0		
13.) Wetted Perimeter, P_w				ft	0	0		
14.) Hydraulic Radius, r = a/P_w		Compute r		ft	0	0		
15.) Channel Slope, s				ft/ft				
16.) Manning's roughness coeff., n								
17.) $v = \frac{1.49 r^{2/3} s^{1/2}}{n}$		Compute v		ft/s	0	0		
18.) Flow Length, L				ft				
19.) $T_t = \frac{L}{3600\,v}$		Compute T_t		hr	0	+ 0	=	0
20.) Watershed or subarea T_c or T_t (add T_t in steps 6, 11, 19)							***hr***	0.690244
							min	41

(210-VI-TR-55, Second Ed., June 1986)

Time of Concentration & Travel Time Worksheet

Note: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments

Sheet Flow (Applicable to T_c only)		**Segment ID**				
1.) Surface Description (use code A-J, table 3-1)			E			
2.) Manning's roughness coeff., n (table 3-1)			0.15	0		
3.) Flow length, L (total L <= 300 ft)		*ft*	15			
4.) Two-yr 24-hr rainfall, P_2	(Sioux Falls IDF)	*in*	3.04	2.688		
5.) Land Slope, s		*ft/ft*	0.5			
6.) $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	Compute T_t	*hr*	0.010134895	+ 0	=	0.010135

Shallow concentrated flow		**Segment ID**				
7.) Surface description (P=paved or U=unpaved)			U			
8.) Flow length, L		*ft*				
9.) Watercourse slope, s		*ft/ft*				
10.) Average velocity, v (figure 3-1)		*ft/s*	0			
11.) $T_t = \frac{L}{3600\,v}$	Compute T_t	*hr*	0	+ 0	=	0

Channel Flow (trapezoidal channel)		**Segment ID**				
12a.) Ditch side slope 1						
12b.) Ditch side slope 2						
12c.) Bottom width		*ft*				
12d.) Depth of flow		*ft*				
12.) Cross sectional flow area, a		ft^2	0	0		
13.) Wetted Perimeter, P_w		*ft*	0	0		
14.) Hydraulic Radius, r = a/P_w	Compute r	*ft*	0	0		
15.) Channel Slope, s		*ft/ft*				
16.) Manning's roughness coeff., n						
17.) $v = \frac{1.49 r^{2/3} s^{1/2}}{n}$	Compute v	*ft/s*	0	0		
18.) Flow Length, L		*ft*				
19.) $T_t = \frac{L}{3600\,v}$	Compute T_t	*hr*	0	+ 0	=	0

20.) Watershed or subarea T_c or T_t (add T_t in steps 6, 11, 19) ***hr*** 0.010135

min 1

(210-VI-TR-55, Second Ed., June 1986)

HMS Model Results Summary

Peak Runoff Flow Rate

	1 Hour Duration				3 Hour Duration				6 Hour Duration				12 Hour Duration				24 Hour Duration			
Area	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**
Gravel Existing Condition																				
SS1	0.17	0.48	1.09	1.46	0.17	0.38	0.72	0.93	0.13	0.27	0.5	0.61	0.09	0.18	0.31	0.4	0.06	0.11	0.2	0.24
SS2	0.39	1.13	2.54	3.41	0.41	0.9	1.68	2.19	0.3	0.64	1.17	1.49	0.21	0.42	0.74	0.93	0.14	0.27	0.46	0.57
SS3	0.24	0.7	1.58	2.12	0.25	0.56	1.04	1.36	0.19	0.39	0.73	0.92	0.13	0.26	0.46	0.58	0.09	0.17	0.28	0.35
SS4	0.29	0.83	1.87	2.5	0.3	0.66	1.23	1.61	0.22	0.47	0.86	1.09	0.15	0.31	0.54	0.68	0.1	0.2	0.34	0.42
SS5	0.08	0.22	0.49	0.66	0.08	0.17	0.32	0.42	0.06	0.12	0.23	0.29	0.04	0.08	0.14	0.18	0.03	0.05	0.09	0.11
SS6																				
SS7								n/a (part of Monarch site during existing conditions)												
SS8	0.1	0.3	0.68	0.91	0.11	0.24	0.45	0.58	0.08	0.17	0.31	0.4	0.06	0.11	0.2	0.25	0.04	0.07	0.12	0.15
Subarea1 (SW of Site)	15.3	29.06	51.67	64.62	11.12	20.15	33.16	40.63	7.84	13.62	21.89	26.43	4.96	8.54	13.46	16.2	3.08	5.14	7.99	9.58
Subarea 2 (NE of Site)	3.84	7.58	13.26	16.48	2.67	4.88	8.13	9.93	1.88	3.27	5.25	6.33	1.19	2.04	3.21	3.87	0.73	1.23	1.9	2.28
Monarch (SW of Site)	2.57	5	8.63	10.69	1.7	3.11	5.16	6.3	1.18	2.06	3.29	3.97	0.75	1.28	2.01	2.42	0.46	0.77	1.19	1.43
Grass Proposed Condition																				
SS1	0.17	0.48	1.09	1.46	0.17	0.38	0.72	0.93	0.13	0.27	0.5	0.64	0.09	0.18	0.31	0.4	0.06	0.11	0.2	0.24
SS2	0.39	1.13	2.54	3.41	0.41	0.9	1.68	2.19	0.3	0.64	1.17	1.49	0.21	0.42	0.74	0.93	0.14	0.27	0.46	0.57
SS3	0.24	0.7	1.58	2.12	0.25	0.56	1.04	1.36	0.19	0.39	0.73	0.92	0.13	0.26	0.46	0.58	0.09	0.17	0.28	0.35
SS4	0.29	0.83	1.87	2.5	0.3	0.66	1.23	1.61	0.22	0.47	0.86	1.09	0.15	0.31	0.54	0.68	0.1	0.2	0.34	0.42
SS5	0.08	0.22	0.49	0.66	0.08	0.17	0.32	0.42	0.06	0.12	0.23	0.29	0.04	0.08	0.14	0.18	0.03	0.05	0.09	0.11
SS6	0.1	0.3	0.68	0.91	0.11	0.24	0.45	0.58	0.08	0.17	0.31	0.4	0.06	0.11	0.2	0.25	0.04	0.07	0.12	0.15
SS7	0.05	0.15	0.34	0.46	0.05	0.12	0.22	0.29	0.04	0.08	0.16	0.2	0.03	0.06	0.1	0.12	0.02	0.04	0.06	0.08
SS8	0.1	0.3	0.68	0.91	0.11	0.24	0.45	0.58	0.08	0.17	0.31	0.4	0.06	0.11	0.2	0.25	0.04	0.07	0.12	0.15
Subarea1 (SW of Site)	3.51	9.14	19.25	25.47	4.11	9.57	18.69	24.21	3.61	7.82	14.64	18.6	2.71	5.58	9.96	12.51	1.9	3.63	6.22	7.8
Subarea 2 (NE of Site)	1.84	2.18	4.58	6.07	0.98	2.28	4.45	5.76	0.86	1.86	3.49	4.43	0.65	1.33	2.37	2.98	0.45	0.86	1.48	1.86
Monarch (SW of Site)	4.07	6.16	9.06	10.66	2.27	3.4	4.98	5.84	1.38	2.06	3	3.52	0.83	1.25	1.8	2.12	0.48	0.72	1.04	1.22
Precip (inches)	1.43	2.1	3.04	3.56	1.94	2.86	4.14	4.85	2.28	3.35	4.85	5.68	2.64	3.89	5.62	6.59	3.04	4.47	6.46	7.58

Peak Flow Rate

	1 Hour Duration				3 Hour Duration				6 Hour Duration				12 Hour Duration				24 Hour Duration			
Area	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**
Gravel Existing Condition																				
To Albany Avenue Sewer (South West of Site)	10.0	10.4	14.4	16.8	10.2	10.1	11.8	13.0	9.0	10.2	10.2	11.1	5.7	9.8	10.2	10.2	3.5	5.9	9.2	10.2
Direct Runoff to South West of Site (side swale runoff)	0.0	0.0	0.0	0.9	0.0	0.0	0.9	1.9	0.0	0.1	0.9	1.8	0.0	0.2	1.0	1.6	0.0	0.2	0.8	0.9
To Whipple Street Sewer through Catch Basin (NE of site)	1.0	1.1	1.1	1.1	1.0	1.1	1.1	1.1	1.0	1.1	1.1	1.1	1.0	1.0	1.1	1.1	0.7	1.0	1.1	1.1
To Whipple Street through Direct Runoff (NE of site side swale overflow)	0.0	0.0	0.0	1.1	0.0	0.0	1.3	2.3	0.0	0.0	1.2	2.1	0.0	0.2	1.1	1.5	0.0	0.2	0.7	0.9
Total Direct Runoff	0.0	0.0	0.0	2.1	0.0	0.0	2.2	4.2	0.0	0.1	2.1	3.9	0.0	0.4	2.0	3.1	0.0	0.4	1.6	1.8
Grass Proposed Condition																				
To Outfall #178 (South West of site)	6.1	8.6	9.5	9.8	6.7	8.8	9.7	10.1	5.5	8.6	9.5	9.9	4.2	7.5	9.1	9.5	2.9	5.4	7.9	8.4
Direct Runoff to South West of Site (side swale runoff)	0.0	0.0	0.6	0.9	0.0	0.1	0.8	1.4	0.0	0.1	0.6	0.8	0.0	0.2	0.4	0.6	0.0	0.1	0.2	0.3
To Whipple Street through Direct Runoff (NE of site side swale overflow)	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.6	0.0	0.0	0.9	1.5	0.0	0.2	0.8	1.4	0.0	0.1	0.7	0.9
Total Direct Runoff	0.0	0.0	0.6	0.9	0.0	0.1	1.4	3.0	0.0	0.1	1.5	2.3	0.0	0.3	1.2	1.9	0.0	0.3	0.9	1.2
Decrease in Peak Flow to SW	3.9	1.9	4.9	6.9	3.5	1.3	2.1	3.0	3.5	1.6	0.7	1.2	1.5	2.3	1.1	0.7	0.6	0.5	1.3	1.8
Percent Decrease	39%	18%	34%	41%	34%	13%	18%	23%	39%	16%	7%	11%	27%	23%	11%	7%	18%	8%	14%	18%

Peak Elevation in Stage-Storage-Discharge Curve

	1 Hour Duration				3 Hour Duration				6 Hour Duration				12 Hour Duration				24 Hour Duration								
Area	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**2-year**	**10-year**	**50-year**	**100-year**	**Max**	**Min**	**Top of Basin**	**Bottom Pond**	**Max Depth**	**Min Freeboar**
Gravel Existing Condition																										
SS1	593.2	593.4	593.7	593.9	593.3	593.7	594	594	593.5	593.8	594	594	593.6	594	594	594	593.9	594	594	594	**594**	**593.2**	**594**	**593**	**1**	**0**
SS2 andSS3	593.2	593.5	593.9	594	593.4	593.8	594	594	593.6	594	594	594	593.7	594	594	594	593.9	594	594	594	**594**	**593.2**	**594**	**593**	**1**	**0**
SS4	593.2	593.5	593.9	594	593.4	593.8	594	594	593.6	594	594	594	593.7	594	594	594	593.9	594	594	594	**594**	**593.2**	**594**	**593**	**1**	**0**
SS5	593.2	593.5	593.8	594	593.4	593.7	594	594	593.5	593.7	594	594	593.7	594	594	594	593.8	594	594	594	**594**	**593.2**	**594**	**593**	**1**	**0**
SS8	593.2	593.5	593.8	594	593.4	593.7	594	594	593.5	593.9	594	594	593.7	594	594	594	593.8	594	594	594	**594**	**593.2**	**594**	**593**	**1**	**0**
Subarea1	596.1	596.7	597.2	597.4	596.1	596.7	597.3	597.6	593.5	596.5	597.2	597.5	591.1	594.3	596.9	597.2	590.2	591.2	593.7	596.5	**597.6**	**590.2**	**598**	**594.78**	**2.82**	**0.4**
Subarea 2	597.3	597.9	598.2	598.3	597.4	598	598.3	598.5	597.2	598	598.3	598.5	597	597.6	598.2	598.4	594.8	597.1	598	598.2	**598.5**	**594.8**	**599**	**596.23**	**2.27**	**0.5**
Monarch											n/a															
Grass Proposed Condition																										
SS1	593.1	593.2	593.5	593.6	593.2	593.4	593.7	593.8	593.3	593.6	593.8	594	593.4	593.7	594	594.2	593.5	593.8	594.2	594.4	**594.4**	**593.1**	**594.5**	**593**	**1.4**	**0.1**
SS2 andSS3	593.2	593.4	593.7	593.9	593.4	593.7	594	594	593.5	593.8	594	594	593.6	594	594	594	593.7	594	594	594	**594**	**593.2**	**594**	**593**	**1**	**0**
SS4	593.1	593.2	593.5	593.6	593.1	593.3	593.5	593.6	593.1	593.2	593.5	593.6	593.1	593.2	593.3	593.4	593.1	593.1	593.2	593.3	**593.6**	**593.1**	**594**	**593**	**0.6**	**0.4**
SS5 and SS6	593.3	593.7	594	594	593.6	594	594	594	593.7	594	594	594	593.9	594	594	594	594	594	594	594	**594**	**593.3**	**594**	**593**	**1**	**0**
SS7 and SS8	593.1	593.1	593.3	593.4	593.1	593.2	593.3	593.4	593.1	593.1	593.3	593.3	593.1	593.1	593.2	593.2	593	593.1	593.1	593.2	**593.4**	**593**	**594**	**593**	**0.4**	**0.6**
Subarea1	593.2	596.8	597.6	598	594.2	597.1	598	598.2	593.4	597	597.7	598.2	592.1	596	597.5	598	591.4	593.4	596.9	597.4	**598.2**	**591.4**	**599**	**595.78**	**2.42**	**0.8**
Subarea 2	596.3	598.2	598.8	599	597.3	598.3	599.1	599.2	596.6	598.3	599.1	599.2	594.8	598.1	598.9	599.1	593.6	596.6	598.4	598.9	**599.2**	**593.6**	**600**	**597.23**	**1.97**	**0.8**
Monarch	592.4	592.6	592.8	592.9	592.3	592.5	592.7	592.8	591.3	592.3	592.5	592.6	590.1	590.9	592.3	592.4	589.7	590	590.4	590.9	**592.9**	**589.7**	**596**	**594.81**	**-1.91**	**3.1**

Proposed Conditions

Monarch	6" restrictor
Sacramento #1	9" restrictor
Sacramento #2	4" restrictor
SS4	6" restrictor
SS7 and SS8	6" restrictor

proposed conditions is grass (CN-78) and existing conditions is gravel (CN -89)

Peak Runoff Flow Rate

Area	1 Hour Duration				3 Hour Duration				6 Hour Duration				12 Hour Duration				24 Hour Duration			
	2-year	10-year	50-year	100-year	2-year	10-year	50-year	100-year	2-year	10-year	50-year	100-year	2-year	10-year	50-year	100-year	2-year	10-year	50-year	100-year
Gravel Existing Condition																				
SS1	0.17	0.48	1.09	1.46	0.17	0.38	0.72	0.93	0.13	0.27	0.5	0.61	0.09	0.18	0.31	0.4	0.06	0.11	0.2	0.24
SS2	0.39	1.13	2.54	3.41	0.41	0.9	1.68	2.19	0.3	0.64	1.17	1.49	0.21	0.42	0.74	0.93	0.14	0.27	0.46	0.57
SS3	0.24	0.7	1.58	2.12	0.25	0.56	1.04	1.36	0.19	0.39	0.73	0.92	0.13	0.26	0.46	0.58	0.09	0.17	0.28	0.35
SS4	0.29	0.83	1.87	2.5	0.3	0.66	1.23	1.61	0.22	0.47	0.86	1.09	0.15	0.31	0.54	0.68	0.1	0.2	0.34	0.42
SS5	0.08	0.22	0.49	0.66	0.08	0.17	0.32	0.42	0.06	0.12	0.23	0.29	0.04	0.08	0.14	0.18	0.03	0.05	0.09	0.11
SS6																				
SS7								n/a (part of Monarch site during existing conditions)												
SS8	0.1	0.3	0.68	0.91	0.11	0.24	0.45	0.58	0.08	0.17	0.31	0.4	0.06	0.11	0.2	0.25	0.04	0.07	0.12	0.15
Subarea1 (SW of Site)	15.3	29.06	51.67	64.62	11.12	20.15	33.16	40.63	7.84	13.62	21.89	26.43	4.96	8.54	13.46	16.2	3.08	5.14	7.99	9.58
Subarea 2 (NE of Site)	3.84	7.58	13.26	16.48	2.67	4.88	8.13	9.93	1.88	3.27	5.25	6.33	1.19	2.04	3.21	3.87	0.73	1.23	1.9	2.28
Monarch (SW of Site)	2.57	5	8.63	10.69	1.7	3.11	5.16	6.3	1.18	2.06	3.29	3.97	0.75	1.28	2.01	2.42	0.46	0.77	1.19	1.43
Gravel Proposed Condition																				
SS1	0.17	0.48	1.09	1.46	0.17	0.38	0.72	0.93	0.13	0.27	0.5	0.64	0.09	0.18	0.31	0.4	0.06	0.11	0.2	0.24
SS2	0.39	1.13	2.54	3.41	0.41	0.9	1.68	2.19	0.3	0.64	1.17	1.49	0.21	0.42	0.74	0.93	0.14	0.27	0.46	0.57
SS3	0.24	0.7	1.58	2.12	0.25	0.56	1.04	1.36	0.19	0.39	0.73	0.92	0.13	0.26	0.46	0.58	0.09	0.17	0.28	0.35
SS4	0.29	0.83	1.87	2.5	0.3	0.66	1.23	1.61	0.22	0.47	0.86	1.09	0.15	0.31	0.54	0.68	0.1	0.2	0.34	0.42
SS5	0.08	0.22	0.49	0.66	0.08	0.17	0.32	0.42	0.06	0.12	0.23	0.29	0.04	0.08	0.14	0.18	0.03	0.05	0.09	0.11
SS6	0.1	0.3	0.68	0.91	0.11	0.24	0.45	0.58	0.08	0.17	0.31	0.4	0.06	0.11	0.2	0.25	0.04	0.07	0.12	0.15
SS7	0.05	0.15	0.34	0.46	0.05	0.12	0.22	0.29	0.04	0.08	0.16	0.2	0.03	0.06	0.1	0.12	0.02	0.04	0.06	0.08
SS8	0.1	0.3	0.68	0.91	0.11	0.24	0.45	0.58	0.08	0.17	0.31	0.4	0.06	0.11	0.2	0.25	0.04	0.07	0.12	0.15
Subarea1 (SW of Site)	15.3	29.06	51.67	64.62	11.12	20.15	33.16	40.63	7.84	13.62	21.89	26.43	4.96	8.54	13.46	16.2	3.08	5.14	7.99	9.58
Subarea 2 (NE of Site)	3.84	7.58	13.26	16.48	2.67	4.88	8.13	9.93	1.88	3.27	5.25	6.33	1.19	2.04	3.21	3.87	0.73	1.23	1.9	2.28
Monarch (SW of Site)	4.07	6.16	9.06	10.66	2.27	3.4	4.98	5.84	1.38	2.06	3	3.52	0.83	1.25	1.8	2.12	0.48	0.72	1.04	1.22
Precip (inches)	1.43	2.1	3.04	3.56	1.94	2.86	4.14	4.85	2.28	3.35	4.85	5.68	2.64	3.89	5.62	6.59	3.04	4.47	6.46	7.58

Peak Flow Rate

Area	1 Hour Duration				3 Hour Duration				6 Hour Duration				12 Hour Duration				24 Hour Duration			
	2-year	10-year	50-year	100-year	2-year	10-year	50-year	100-year	2-year	10-year	50-year	100-year	2-year	10-year	50-year	100-year	2-year	10-year	50-year	100-year
Gravel Existing Condition																				
To Albany Avenue Sewer (South West of Site)	10.0	10.4	14.4	16.8	10.2	10.1	11.8	13.0	9.0	10.2	10.2	11.1	5.7	9.8	10.2	10.2	3.5	5.9	9.2	10.2
Direct Runoff to South West of Site (side swale runoff)	0.0	0.0	0.0	0.9	0.0	0.0	0.9	1.9	0.0	0.1	0.9	1.8	0.0	0.2	1.0	1.6	0.0	0.2	0.8	0.9
To Whipple Street Sewer through Catch Basin (NE of site)	1.0	1.1	1.1	1.1	1.0	1.1	1.1	1.1	1.0	1.1	1.1	1.1	1.0	1.0	1.1	1.1	0.7	1.0	1.1	1.1
To Whipple Street through Direct Runoff (NE of site side swale overflow)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Direct Runoff	0.0	0.0	0.0	0.9	0.0	0.0	0.9	1.9	0.0	0.1	0.9	1.8	0.0	0.2	1.0	1.6	0.0	0.2	0.8	0.9
Gravel Proposed Condition																				
To Outfall #178 (South West of site)	8.5	9.1	10.0	10.3	8.5	9.2	10.0	10.3	7.8	9.0	9.8	10.1	6.9	8.1	9.4	9.7	4.4	7.0	8.2	8.7
Direct Runoff to South West of Site (side swale runoff)	0.0	0.0	0.6	0.9	0.0	0.1	0.8	1.4	0.0	0.1	0.6	0.8	0.0	0.2	0.4	0.6	0.0	0.1	0.2	0.3
To Whipple Street through Direct Runoff (NE of site side swale overflow)	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.6	0.0	0.0	0.9	1.5	0.0	0.2	0.8	1.4	0.0	0.1	0.7	0.9
Total Direct Runoff	0.0	0.0	0.6	0.9	0.0	0.1	1.4	3.0	0.0	0.1	1.5	2.3	0.0	0.3	1.2	1.9	0.0	0.3	0.9	1.2
Decrease in Peak Flow to SW	1.5	1.3	4.4	6.5	1.7	0.9	1.8	2.7	1.2	1.2	0.4	1.0	-1.2	1.7	0.8	0.5	-0.9	-1.1	1.0	1.5
Percent Decrease	15%	12%	31%	39%	16%	9%	15%	21%	13%	12%	4%	9%	-21%	17%	8%	5%	-25%	-18%	11%	15%

Peak Elevation in Stage-Storage-Discharge Curve

Area	1 Hour Duration				3 Hour Duration				6 Hour Duration				12 Hour Duration				24 Hour Duration			
	2-year	10-year	50-year	100-year	2-year	10-year	50-year	100-year	2-year	10-year	50-year	100-year	2-year	10-year	50-year	100-year	2-year	10-year	50-year	100-year
Gravel Existing Condition																				
SS1	593.2	593.4	593.7	593.9	593.3	593.7	594	594	593.5	593.8	594	594	593.6	594	594	594	593.9	594	594	594
SS2 andSS3	593.2	593.5	593.9	594	593.4	593.8	594	594	593.6	594	594	594	593.7	594	594	594	593.9	594	594	594
SS4	593.2	593.5	593.9	594	593.4	593.8	594	594	593.6	594	594	594	593.7	594	594	594	593.9	594	594	594
SS5	593.2	593.5	593.8	594	593.4	593.7	594	594	593.5	593.7	594	594	593.7	594	594	594	593.8	594	594	594
SS8	593.2	593.5	593.8	594	593.4	593.7	594	594	593.5	593.9	594	594	593.7	594	594	594	593.8	594	594	594
Subarea1	596.1	596.7	597.2	597.4	596.1	596.7	597.3	597.6	593.5	596.5	597.2	597.5	591.1	594.3	596.9	597.2	590.2	591.2	593.7	596.5
Subarea 2	597.3	597.9	598.2	598.3	597.4	598	598.3	598.5	597.2	598	598.3	598.5	597	597.6	598.2	598.4	594.8	597.1	598	598.2
Monarch								n/a												
Gravel Proposed Condition																				
SS1	593.1	593.2	593.5	593.6	593.2	593.4	593.7	593.8	593.3	593.6	593.8	594	593.4	593.7	594	594.2	593.5	593.8	594.2	594.4
SS2 andSS3	593.2	593.4	593.7	593.9	593.4	593.7	594	594	593.5	593.8	594	594	593.6	594	594	594	593.7	594	594	594
SS4	593.1	593.2	593.5	593.6	593.1	593.3	593.5	593.6	593.1	593.2	593.5	593.6	593.1	593.2	593.3	593.4	593.1	593.1	593.2	593.3
SS5 and SS6	593.3	593.7	594	594	593.6	594	594	594	593.7	594	594	594	593.9	594	594	594	594	594	594	594
SS7 and SS8	593.1	593.1	593.3	593.4	593.1	593.2	593.3	593.4	593.1	593.1	593.3	593.3	593.1	593.1	593.2	593.2	593	593.1	593.1	593.2
Subarea1	597.1	597.8	598.3	598.5	597.1	597.9	598.4	598.7	596.9	597.6	598.3	598.6	595.7	597.2	598.1	598.4	592.5	595.8	597.4	597.9
Subarea 2	598.3	598.9	599.2	599.3	598.4	599	599.3	599.5	598.2	598.9	599.3	599.5	598	598.6	599.2	599.4	595.4	598.1	598.9	599.1
Monarch	592.4	592.6	592.8	592.9	592.3	592.5	592.7	592.8	591.3	592.3	592.5	592.6	590.1	590.9	592.3	592.4	589.7	590	590.4	590.9

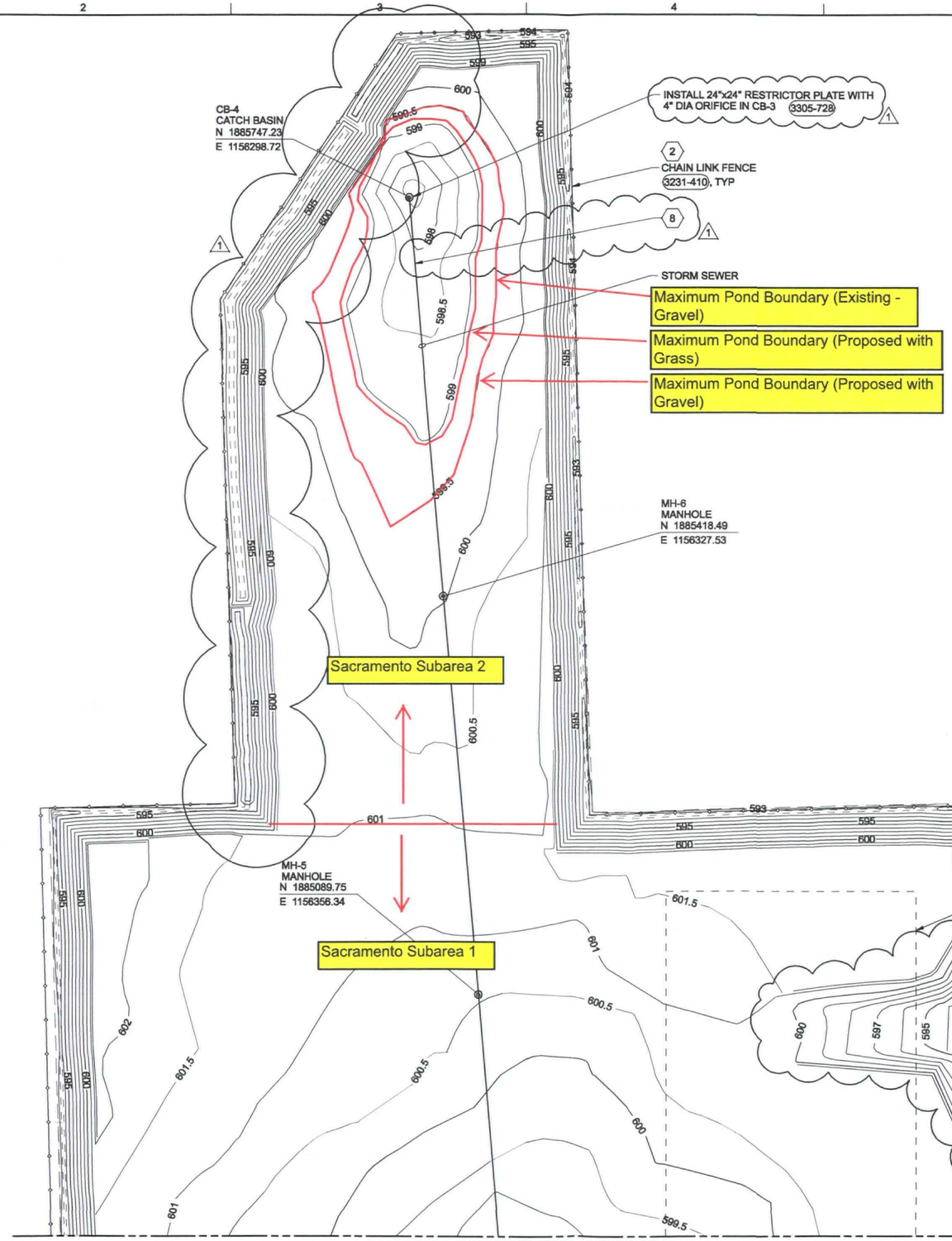
	Max	Min	Top of Basin	Bottom Pond	Max Depth	Min Freeboar
	594	593.2	594	593	1	0
	594	593.2	594	593	1	0
	594	593.2	594	593	1	0
	594	593.2	594	593	1	0
	594	593.2	594	593	1	0
	597.6	590.2	598	594.78	2.82	0.4
	598.5	594.8	599	596.23	2.27	0.5
	594.4	593.1	594.5	593	1.4	0.1
	594	593.2	594	593	1	0
	593.6	593.1	594	593	0.6	0.4
	594	593.3	594	593	1	0
	593.4	593	594	593	0.4	0.6
	598.7	592.5	599	595.78	2.92	0.3
	599.5	595.4	600	597.23	2.27	0.5
	592.9	589.7	596	594.81	-1.91	3.1

Proposed Conditions

Monarch	6" restrictor
Sacramento #1	9" restrictor
Sacramento #2	4" restrictor
SS4	6" restrictor
SS7 and SS8	6" restrictor

Both proposed conditions and existing conditions are gravel - CN -89

Attachment 4 – Existing and Proposed Ponding Areas



KEY NOTES:
(NOTES APPLY TO DWGS C-7 AND C-8)

1. BACKFILL MANHOLES, CATCH BASINS AND OTHER STRUCTURES WITH A STORM SEWER CONNECTION WITH CONTROLLED LOW STRENGTH FILL FROM BOTTOM OF EXCAVATION TO TOP OF PIPE BETWEEN CONNECTION AND FIVE FEET FROM CONNECTION ALONG NEW PIPE.
2. INSTALL PERIMETER FENCE WITHIN 6 INCHES OF PROPERTY LINE, OR EXISTING FENCE AS DIRECTED BY CH2M HILL.
3. MANHOLE AND CATCH BASIN COORDINATES ARE TO THE CENTER OF THE STRUCTURE.
4. EACH GATE SHALL HAVE A 16 FOOT OPENING FOR A TOTAL OPENING OF 32 FEET. CENTER GATES AT EXISTING GATE LOCATION. ONE GATE SHALL SLIDE NORTH, ONE GATE SHALL SLIDE SOUTH. GATES SHALL LATCH TOGETHER AT MIDDLE. DO NOT PROVIDE A CENTER POST FOR CATCH.
5. EXTEND PIPE NORTH FROM MANHOLE MINIMUM OF 20 FEET. CAP PIPE WITH CH2M HILL APPROVED WATER TIGHT MECHANICAL SEAL. SEAL SHALL BE IRON GRIP OR T-HANDLE ALUMINUM GRIPPER FROM CHERNE INDUSTRIES, OR CH2M HILL APPROVED EQUAL. PROTECT PIPE DURING INSTALLATION.
6. CONNECT TO EXISTING STORM SEWER WITH A WATER TIGHT CONNECTION. 3305-730
7. 20'x20' PERFORATED PIPE UNDERDRAIN CENTER AT CATCH BASIN. INSTALL ON TOP OF GEOTEXTILE FABRIC, ON BOTTOM OF AGGREGATE BASE. CONNECT PERFORATED PIPE TO CATCH BASIN WITH 4 CONNECTIONS, AS SHOWN. PERFORATED PIPE IS NOT NEEDED FOR ALTERNATE BID ITEMS #3 OR #4. PIPE SHALL BE 6" HDPE, SDR 17, ASTM D 3350-02, WITH 4 0.5 INCH HOLES EQUALLY SPACED AROUND PERIMTER OF PIPE AT 4 INCH CENTERS ALONG THE LENGTH OF IPIE.
8. EXCAVATE PIPE TRENCH TO A BOTTOM ELEVATION THAT WILL PROVIDE 3.5 FEET BETWEEN THE PROPOSED GRADE AND THE BOTTOM OF THE TRENCH. BACKFILL FROM BOTTOM OF EXCAVATION TO THE TOP OF PIPE WITH CONTROLLED LOW STRENFTH FILL. SEE DWG C-9 AND C-10 FOR LENGTH.

N

0 50 100 150
Scale In Feet

NO.	DATE	DSGN	DR	CHK	APVD
1	06/27/08	BA BROWN	MA GERIK	AR JONES	RA YOLO

ADDENDUM NO. 1
REVISION
MAG RAY
BY APVD

CH2MHILL

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CIVIL
SITE PLAN
NORTH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	327757
DWG	C-7
SHEET	9

ISSUED FOR 90% REVIEW

FILENAME: dn05c007_327757.dgn PLOT DATE: 6/27/2008 PLOT TIME: 11:52:27 AM

MATCH LINE SEE DRAWING C-7

STORM SEWER

MH-4
MANHOLE
N 1884761.01
E 1156385.15

CB-7
CATCH BASIN
N 1884622.82
E 1156023.05

CB-6
CATCH BASIN
N 1884628.74
E 1156207.61

INSTALL 24" x 24" RESTRICTOR PLATE WITH 6" DIA ORIFICE ON DOWNSTREAM PIPE OPENING IN CB-6 (3305-728)

5 CAP PIPE FOR END OF PHASE 1

MH-3
MANHOLE
N 1884530.41
E 1156405.36

CB-1
CATCH BASIN (3305-714)
N 1884306.12 (3305-715)
E 1156316.88

MH-2
MANHOLE
N 1884306.15
E 1156306.88

20' OPENING
CANTILEVER SLIDE GATE (3231-425)
CENTER AT
N 1884171.50
E 1156215.88

20' OPENING
CANTILEVER SLIDE GATE (3231-425)
CENTER AT
N 1884031.72
E 1156220.82

MH-1
MANHOLE
N 1884001.20
E 1156257.00

2 CHAIN LINK FENCE (3231-410), TYP

Monarch Site

MH-1A
MANHOLE
N 1884105.13
E 1156274.00

CB-5
CATCH BASIN
N 1884096.28
E 1156328.10

INSTALL 24"x24" RESTRICTOR PLATE WITH 6" DIA ORIFICE IN CB-5 (3305-728)

INSTALL 24"x24" RESTRICTOR PLATE WITH 6" DIA ORIFICE IN CB-1 (3305-728)

3123-115

DRAWING NOTE:
1. *REFER TO DRAWING C-7 FOR SITE PLAN KEY NOTES.*

Maximum Pond Boundary (Existing - Gravel)

Maximum Pond Boundary (Proposed with Grass)

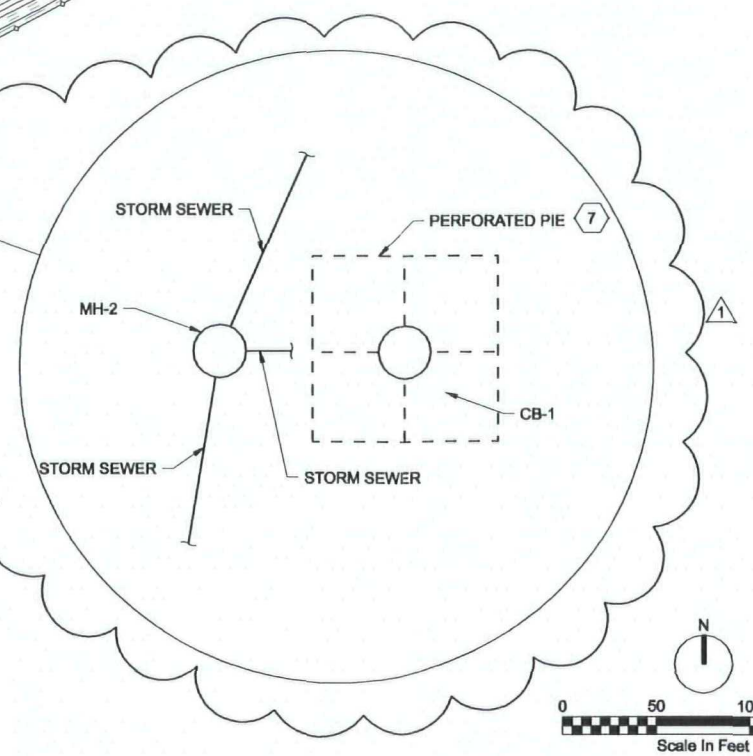
Maximum Pond Boundary (Proposed with Gravel)

ALTERNATE BID ITEM #2:
PROPOSED PLACEMENT OF CA-1 AGGREGATE. PLACEMENT OF CA-1 IS PROPOSED AS AN ALTERNATIVE TO THE EARTH FILL WITH TOPSOIL OR GRANULAR FILL COVER MATERIALS. LOCATION OF CA-1 IS SUBJECT TO CHANGE.

CB-3
CATCH BASIN
N 1884542.30
E 1156415.40

INSTALL 30"x30" RESTRICTOR PLATE WITH 9" DIA ORIFICE ON DOWNSTREAM PIPE IN CB-2 (3305-728)

CB-2
CATCH BASIN
N 1884530.38
E 1156415.36



N

0 50 100 150
Scale In Feet

NO.	DATE	DSGN	DR	CHK	REVISION
1	06/27/08	BA BROWN	MA GERIK	AR JONES	ADDENDUM NO. 1

BY	APVD
MAG	RAY
	APVD
	RA YOLO

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CH2MHILL

CIVIL
SITE PLAN SOUTH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	327757
DWG	C-8
SHEET	10

ISSUED FOR 90% REVIEW

FILENAME: dn05c008_327757.dgn PLOT DATE: 6/27/2008 PLOT TIME: 11:52:34 AM

Attachment 5 – Erosion and Sediment Control Plan (Stormwater Pollution Prevention Plan)

Final

Main Site Cover Construction Storm Water Pollution Prevention Plan

For the
Former Celotex Site
2800 South Sacramento Avenue
Chicago, Illinois 60623

Prepared for

Honeywell International Inc.

August 2008

CH2MHILL

Table of Contents

Tables

Appendices

Acronyms and Abbreviations

BMP	Best Management Practices
C	Run-off coefficient
USEPA	United States Environmental Protection Agency
MWRDGC	Metropolitan Water Reclamation District of Greater Chicago
MSDS	Material Safety Data Sheet
NPDES	National Pollutant Discharge and Elimination System
IEPA	Illinois Environmental Protection Agency
CSSC	Chicago Sanitary and Ship Canal
SWP3	Storm Water Pollution Prevention Plan

1.0 Introduction

This Storm Water Pollution Prevention Plan (SWP3) was developed for Main Site cover construction activities associated with the former Celotex Site located in Cook County, Chicago, Illinois. The SWP3 was developed following the General National Pollutant Discharge Elimination System Permit for Storm Water Discharges from Construction Site Activities for Illinois, as guidance. A copy of this permit (ILR10) is provided in Appendix A.

This SWP3 applies to construction activities at two locations in Cook County, Chicago, Illinois, which are associated with the former Celotex Site (Main Site). The scope of this SWP3 applies to construction activities to be performed by CH2M HILL and CH2M HILL's subcontractors on the Sacramento and Monarch parcels of the Main Site in the City of Chicago, in Cook County, Illinois. A map showing the general location of the Main Site parcels is provided in Appendix B.

The former Celotex Main Site consists of an approximately 20-acre parcel currently owned by the 2600 Sacramento Corporation (Sacramento), and an approximately 2-acre parcel currently owned by Monarch Asphalt (Monarch). The primary staging area for construction equipment will be located at the Monarch Asphalt property, 3031 South Albany Avenue, Chicago, Illinois, in Cook County. The United States Geological Survey (USGS) reference for the Main Site indicates that it is situated in the West 1/2 of the Southwest 1/4 of Section 25, Township 39 North, Range 13 East of the Third Prime Meridian on the Englewood 7.5 Minute Quadrangle. An additional staging area, yet to be determined, will be utilized during cover construction activities on the Monarch parcel. Similar practices will be utilized for both the Monarch parcel and the additional staging areas.

This plan provides an overview of construction activities and includes procedures that will be implemented during construction activities to prevent or reduce pollutants in storm water discharges. Each of the following elements is addressed:

- Site Description
- Control measures or Best Management Practices (BMPs) that will be implemented to control pollutants in storm water discharges
- Procedures for maintaining control measures
- Inspection procedures
- Identification of non-storm water discharges

This plan will be modified if there is a change in design, operation, or maintenance approach for construction activities. The plan will also be revised if procedures or controls prove to be ineffective in eliminating or significantly minimizing pollutants from potential sources.

2.0 Site Description

This SWP3 addresses cover construction activities at the former Celotex Site in Chicago, Illinois.

The Main Site was historically used for making, storing, and selling asphalt-roofing products. Former operations at the 22-acre Main Site during the approximate period of 1911 to 1989 may have resulted in the release of polycyclic aromatic hydrocarbons (PAHs) to the ground and into the air, thereby potentially impacting surface soil in the vicinity of the Main Site. Residential properties are located north, west and northeast of the Main Site. Facility closure occurred in 1989 and demolition of the Main Site was conducted in 1993.

2.1 Description of Construction Activities

2.1.1 Main Site

Construction activities for this SWP3 will include: demolition of abandoned utility poles, weigh scale near the current Sacramento parcel entrance, near surface and subsurface concrete structures, existing fences, removal of trees and general debris, removal and re-contouring of side slope and swale area materials on the Sacramento and Monarch parcels, installation of a storm sewer system, placement of the Sacramento parcel cover (granular or granular and topsoil material), placement of the Monarch parcel cover (granular material), storm water management activities, construction of a new perimeter fence and disposal of general debris and excavated soil off-site at an approved disposal facility.

2.1.2 Staging Areas

Construction activities at the staging areas include: temporary parking, field trailers, portable sanitary facilities, and laydown of equipment and materials. A 500-gallon capacity diesel aboveground storage tank (AST) will be located at the staging area with lined and bermed secondary containment. A decontamination area will also be established in the staging area using secondary containment and ecology blocks to prevent runoff. An entrance and exit road will be constructed and maintained, and dust abatement measures will be in place during operations. The location of the primary staging area is shown on Figure B-1 and a plan view of the primary staging area is shown on Figure B-2 provided in Appendix B.

Following use of the Monarch parcel for staging activities, cover construction activities as described in Section 2.2.3 will be completed and an alternate staging area will be identified for use during the Monarch cover construction activities.

2.1.3 Potential Sources of Contamination from Construction Activities

The potential sources of pollutants that could be discharged in storm water during construction activities include:

- Vehicle and equipment fueling
- Vehicle and equipment decontamination areas
- Loading and unloading areas
- Vehicle and equipment maintenance areas
- Soil excavation and deposition areas
- Soil stockpile areas
- Waste and material storage areas

2.2 Affected Area of the Site

The affected areas of the Main Site are described as three subareas due to the differing activities to be completed at each area. The three subareas cover the staging areas, including the Monarch Parcel for a portion of the project, along with construction activities at both the Sacramento and Monarch parcels. Upon completion of staging area use, they will be disturbed for cover construction activities. For the purposes of this SWP3, the staging areas and Main Site areas disturbed by cover construction activities are considered a cumulative whole for the project.

2.2.1 Staging Areas

The staging areas will encompass an area of approximately 2 acres, of which, varying acreage will be disturbed at any given time. The disturbed area includes the area for poly-lined temporary stockpiles, temporary parking, field trailers, portable sanitary facilities, laydown of equipment and materials, and the construction site entrance and exit road. A 500-gallon capacity aboveground storage tank (AST) containing diesel fuel will be located at the staging area with lined and bermed secondary containment. A truck decontamination area will also be established in the staging area using secondary containment and ecology blocks to prevent runoff.

2.2.2 Sacramento Parcel

The Sacramento parcel encompasses an area of approximately 20-acres. The entire property will be disturbed during cover construction. Fence removal, temporary construction and silt fence placement, truck scale demolition, and removal of miscellaneous debris and surface and shallow subsurface features will be conducted. The side slopes will be cleared of trees and vegetation followed by excavation to re-establish a consistent sized shallow swale around the perimeter of the property. The cover material will consist of either ungraded gravel (CA-6, surface area), or topsoil with clean earth fill (swale and side slope area). The entire parcel will be covered with at least 24 inches of clean material.

2.2.3 Monarch Parcel

The Monarch parcel encompasses an area of approximately 2-acres. The entire property will be disturbed during cover construction. The side slopes will be cleared of trees and vegetation followed by excavation to create a shallow swale around the perimeter of the property. The cover material will consist of either CA-1 stone, or a combination of CA-6 gravel over earthen fill. The entire parcel will be regraded with at least 24-inches of clean material.

2.3 Runoff Coefficient

The runoff coefficient (C) is a factor used to predict peak runoff flow using the Rational Formula. This is influenced by the type of ground cover, the type of soil, and the slope of the terrain. The less precipitation that infiltrates into the ground, the higher the C value. The weighted C values for the staging areas, cover construction areas, and side slope/swale area are determined in the following subsections. Runoff coefficients were calculated using typical C values from *City of Chicago Stormwater Management Ordinance Manual.*

2.3.1 Staging Area

The pre-construction (existing) weighted runoff coefficient for the staging areas are:

Type of Cover	% of Area Covered	Typical C Value	Weighted C Value
Undeveloped	25	.10	.03
Gravel	75	.70	.53
		Weighted C =	.56

Soil at the staging areas are generally composed of gravel with some scattered grass and brush growing up through the gravel. The area has a few small trees around the perimeter of the property. The estimated C value after construction is complete is 0.70 to reflect the proposed gravel condition. Side slopes proposed will be grassed swales with a runoff coefficient of 0.47 (heavy soil, steep >7%).

2.3.2 Main Site

Before construction activities, the average weighted runoff coefficient for the Main Site equals:

Type of Cover	% of Area Covered	Typical C Value	Weighted C Value
Soil and grass (side slope and swale area)	25	.42	.11
Aggregate (CA-6) (Sacramento Parcel) Aggregate (CA-1) (Monarch Parcel)	75	.70	.52

		Weighted C =	.63

The estimated C value after construction for the top of the Sacramento Parcel would be 0.30 (heavy soil, 0% to 2%) for the grass condition alternative or 0.70 for the gravel condition alternative. Side slopes will be vegetated corresponding to a 0.30 C value and the Monarch Parcel will be a gravel condition (C value of 0.70) to be paved in the future (C value of 0.95)..

2.4 Site Map

A figure showing the location of the staging areas, Monarch parcel and Sacramento parcel is provided as Figure B-1 in Appendix B. Figure B-1 illustrates the general drainage patterns. Drawings of the Main Site areas (Figures B-2 through B-4) illustrate other features and include the following, as necessary:

- Construction site boundaries
- Areas of soil disturbance
- Areas that will not be disturbed (none)
- Approximate slopes after major grading
- Locations of major structural and non-structural controls
- Locations where stabilization practices are expected to occur
- Springs, streams, wetlands, and other surface waters
- Storm water discharges
- 100 year flood plain, if determined
- Storage area locations (equipment, supplies, waste, stockpiles, etc.)

The figures will be updated to reflect any warranted changes or additions. Inspections may reveal necessary revisions and the figures may be manually updated.

2.5 Topography

Topography in this area is generally flat, developed with some areas of very gentle relief.

2.6 Area and Site Surface Waters

The Collateral Channel, which is a tributary to the Chicago Sanitary and Ship Canal (CSSC), is located approximately 200 feet south of the staging area across 31st Street. The Collateral Channel is a north-south slip, approximately 1,500 feet long and 130 feet wide. It empties into the CSSC.

The storm water from the Main Site enters the City of Chicago's combined sanitary and storm water collection system. The combined sanitary and storm water is treated by the MWRDGC. Future storm water from the Main site will eliminate all flow to the City's

combined sewer system by connecting directly to the collateral channel outfall pipe as proposed in the *Honeywell Celotex Main Site Cover Construction Work Plan Addendum – July 23, 2008 Update* (CH2M HILL, July 2008).

2.7 Endangered/Threatened Species

There are no known endangered/threatened species at the staging area or residential properties locations.

2.8 Historic Preservation

There are no known historic properties or places at the staging area or Main Site.

3.0 Best Management Practices for Storm Water Pollution Prevention

CH2M HILL will implement the Best Management Practices (BMPs) described below to prevent and control storm water run-on and run-off during construction activities at the staging area and Main Site. The description of controls includes:

- Control measures for potential pollutant sources
- Erosion and sediment controls, including structural and stabilization controls
- Material handling
- Spill prevention, control, and response
- Measures to protect endangered/threatened species
- Measures to protect Historic Places

3.1 Control Measures for Pollutant Sources during Construction Activities

The potential pollutant sources were described previously in Section 2.1.3. Specific measures to control pollutant discharges from these sources include:

- **Vehicle and Equipment Fueling Areas:** All fueling stations will have temporary secondary containment around the fuel tanks.
- **Vehicle and Equipment Decontamination Areas:** Vehicles and equipment will be cleaned of material prior to leaving the properties. A temporary decontamination area will be established, as necessary, and located within the construction site. If liquid decontamination is necessary, the liquids and solids generated will be contained, collected, sampled, and disposed at an approved disposal facility.
- **Loading and Unloading Areas:** Any soils or other materials spilled during loading or unloading will be cleaned up immediately. This includes soils on the outside of trucks (side rails), ground, and road surfaces.
- **Vehicle and Equipment Maintenance Areas:** If vehicle or equipment maintenance is necessary, it will be performed in an area designated for this purpose. Any spills will be cleaned up immediately. Precautions will be taken to prevent the release of pollutants to the environment from vehicle and equipment maintenance. Precautions will include the use of drip pans, mats, and other similar methods. No vehicle wash water will be allowed to run off the construction site or enter waters of the state.
- **Excavation and Deposition Areas:** To prevent the mobilization of pollutants in storm water runoff from excavation and deposition areas, BMPs described in the Erosion and Sediment Control section will be implemented.
  - Geotextile fabric may be placed over storm sewer inlets in areas where construction is being conducted. The geotextile fabric for use in inlet protection shall be nonwoven fabric consisting of continuous chain polymer filaments, formed into a

stable network by needle punching. The inlet filter material will be cleaned every storm event or as needed.

- **Soil Stockpile Areas:** In general, stockpiles are managed in the following manner:
  - Stockpiles of soil are placed on plastic sheeting at least 2-feet from the excavation within the disturbed area.
  - When precipitation is forecast, stockpiles of soil will be provided with a liner, cover, and perimeter berm to prevent run-on, run-off, and infiltration of precipitation. Typically, liners and covers are 6 mil polyethylene and berms are typically hay bales placed beneath the liner.
  - Covers and perimeter berms will be secured in place when not in use and at the end of each workday, or as necessary to prevent wind dispersion or runoff from major precipitation events.
- **Waste and Material Storage Areas:** Materials on the sites will be stored in areas designated for that purpose. Suitable measures will be taken in these areas to reduce the likelihood of a discharge. For example, when practicable, materials will be sheltered from rainfall.
- **Offsite Vehicle Tracking:** Sediment and the generation of dust shall be minimized.

3.2 Erosion and Sediment Controls

Construction activities will be implemented to attain the following goals and criteria, as applicable:

- Implement erosion and sediment controls during construction to retain sediment onsite to the extent practicable.
- Select, install, and maintain control measures in accordance with manufacturer's specifications and good engineering practices. If periodic inspections or other information indicate that a control measure has been used inappropriately or incorrectly, that control measure will be modified or replaced, as necessary.
- In the event that sediment escapes the construction site, remove offsite accumulations of sediment to minimize offsite impacts.
- Implement construction practices that prevent litter, construction debris, and chemicals exposed to storm water from becoming a pollutant source for storm water discharges.
- Erosion and sediment runoff is controlled through the use of structural and / or stabilization practices. Structural control practices may include the use of straw bales, silt fence, earth dikes, drainage swales, sediment traps, sediment basins, etc. Stabilization practices may include temporary or permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, etc.

Table 3-1 lists several structural and stabilization measures that may be used to control the quality of the storm water coming off the construction sites.

TABLE 3-1

Structural and Stabilization Measures
Main Site Cover Construction
Former Celotex Site – Chicago, Illinois

Control Measure	Location	Description of Control Measure[1]
Silt Fence	Along the perimeter of the construction sites.	To protect streams or wetland areas, to prevent erosion, and to keep sediment onsite. Silt fence consists of posts with filter fabric stretched across the posts. The lower end of the fence fabric is anchored or vertically trenched and covered with backfill. This prevents water from passing by the fence without first being filtered. The fabric allows for the water to pass offsite while retaining the sediment onsite.
Straw Bales	Around areas requiring protection, such as streams, and to form a temporary containment.	Straw bales work much like silt fence and may be used instead of silt fence. They can be used to form a barrier or redirect water. They impede storm water flow. Unlike silt fence, straw bales do not allow water to flow through freely, thus they are used where detention, not just filtration, is necessary.
Limit Entrance/Exit	Designated construction site entrances/exits. Exact location is determined in the field.	The purpose is to reduce tracking of soil off the site. These entrances/exits are usually constructed of fabric and large stone. The fabric is laid down on the soil and the rock is then placed on the fabric. The rough surface will shake and pull the soil from tires.
Temporary Seeding	Disturbed areas where the construction activity has temporarily ceased for more than 21 days. Seeding is to be implemented within 14 days of activity ceasing.	Growing of a short-term vegetative cover on disturbed areas that may be in danger of erosion.
Mulching	On slopes steeper than 2:1 or on areas that have been seeded. Must be implemented within 14 days of activity ceasing.	Temporary soil stabilization or erosion control practices where materials, such as, grass, wood chips, hay, etc. are placed on the soil surface.
Preservation of Natural Vegetation	Wherever practical.	Wherever possible, existing vegetation should be retained. It minimizes erosion potential and protects water quality. The preservation of natural vegetation between the silt fence and stream will provide additional water quality improvement prior to the storm water entering State or U.S. waters.
Permanent Seeding or Sod	On appropriate disturbed areas once construction is complete and within 14 days.	Provides permanent stabilization to the soil and reduces erosion.

[1] There are no identified streams or wetland areas located near the Main Site.

3.3 Material Handling

The following material handling procedures will be implemented during construction activities:

- Waste containers (solid and liquid) will be emptied frequently enough to prevent them from overflowing. The area will be kept free of trash and spills. Liquid waste containers, such as waste oil, will have secondary containment.
- Trash receptacles will be equipped with covers.
- Storage containers (drums, bags, etc.) will be stored away from traffic to prevent accidental spills.
- Containers will be kept closed, except to add or remove material, as necessary.
- Containers will be stored in such a manner to prevent corrosion that could result from contact between the container and the ground, resulting in a release.
- Containers will be labeled to show name and type of substance, health hazards, and other appropriate information.
- Material Safety Data Sheets (MSDS) for substances used or stored onsite will be available for review and use.

Materials stored onsite shall be inventoried on the form provided in Appendix E and records of the inventories will be maintained at the CH2M HILL field office.

3.4 Spill Prevention, Control, and Response

The following procedures shall be followed for the prevention and mitigation of minor spills and releases during construction activities.

Incidental spills and releases are considered small spills (not reportable). CH2M HILL and CH2M HILL's subcontractors shall respond to all minor spills as soon as practicable. CH2M HILL and CH2M HILL's subcontractors shall respond to medium or large spills (reportable quantities or larger), according to the project Spill Response Plan and the Emergency Response Plan contained in the Health and Safety Plan. These plans are maintained at the field office.

General spill prevention procedures follow:

- Fuel and waste containers/tanks shall be bermed or otherwise contained to prevent releases. The bermed volume shall be equal to the full capacity of the container(s)/tank(s). When practicable, for areas on soil, the area inside the berm will be covered with an oil resistant membrane to minimize soil contamination in the event of a spill. Additionally, if practicable, these areas will be sheltered from precipitation to prevent overflow of the bermed volumes.
- Fueling operations and vehicle/equipment maintenance shall be performed at designated facilities, when practical.
- Drip pans and tarpaulins will be used during maintenance and fueling to capture minor spills and leaks during fueling and maintenance.

- Each location having fueling operations, fuel containers/tanks, and/or waste container/tanks shall have a sufficient number of spill kits to contain minor spills and leaks.
- For detailed spill response procedures, refer to the Spill Response Plan. The general procedures for spill response are as follows:
  - Assure personal safety, and then evaluate the area and nature of the spill.
  - Identify the source and stop the flow of pollutants, if it can be done safely.
  - Contain the spill with absorbent materials or by berming the area.
  - Remove and contain the spilled material, contaminated media, and cleanup material, and transport to the designated location for collection of such material.
  - Contact the appropriate personnel listed in the Spill Response Plan.
  - Record pertinent facts.

3.5 Measures to Protect Endangered/Threatened Species

There are no endangered species identified in the remedial action area. If endangered species and/or critical habitats are found on or near these sites, work will be stopped and the situation evaluated.

3.6 Measures to Protect Historic Places

There are no historic places identified in the remedial action area. If historic places are found on or near these sites, work will be stopped and the situation evaluated.

3.7 Other Controls

3.7.1 Employee Training

Appropriate CH2M HILL and CH2M HILL subcontractor personnel will be trained and aware of the SWP3 requirements and measures that will need to be implemented. Additionally, CH2M HILL's subcontractors will be responsible for their lower tier subcontractor(s) being trained and aware of the requirements and measures to be implemented under the SWP3.

3.7.2 General Controls

The following general erosion control requirements shall be implemented during construction activities:

- Minimize the time that bare soil is exposed before stabilization.
- Minimize the disturbance of existing vegetation.
- Prevent solid materials, oils, greases, etc. from discharging into waters of the State and U.S.

4.0 Maintenance

All erosion and sediment control measures and other protection measures will be maintained in effective operating condition. Maintenance will be performed on an "as-needed" basis. Specific maintenance requirements include, but are not limited to:

- Removal of sediment and other debris collected behind silt fence or straw bales.
- Gravel and sediment shall be removed from construction entrances/exits and replaced with new gravel whenever 50 percent or more of the void space appears filled with sediment, based on visual inspection.

5.0 Inspections

Inspections will be performed to review the areas for evidence of, or the potential for, pollutants leaving the site. The controls identified in Section 3 will be inspected to verify they are being implemented properly.

As necessary, the SWP3 will be revised to incorporate any changes that come about as a result of the inspection. Changes that affect the description of pollutant sources or the pollution prevention control measures will be made to the SWP3 within 7 days of the inspection. A record of the inspections will be maintained at the CH2M HILL field office as part of the SWP3.

5.1 Requirements During Construction

The following areas will be inspected at a minimum, every 14 days, and within 24 hours of the end of a storm event of 0.5 inches or greater:

- Disturbed areas that have not been finally stabilized
- Storage areas that are exposed to precipitation
- Structural control measures
- Construction entrances/exits

Inspections shall be the responsibility of and performed by CH2M HILL and/or CH2M HILL's subcontractors. Inspections will be recorded on the SWP3 Inspection Checklist, provided in Appendix D. A copy of the detailed area drawings will be used during inspections and will be manually updated during inspections, as necessary, to reflect any changes or additions to the following features:

- Construction site boundaries
- Areas of soil disturbance
- Areas which will not be disturbed
- Approximate slopes after major grading
- Areas used for storage of materials, soil, or waste
- Locations of major erosion control features/structures (silt fence, straw bales, etc.)
- Springs, streams, wetlands, and other surface waters
- Storm water discharge locations

The updated drawings and Inspection Checklists will be maintained at the CH2M HILL field office. Table 5-1 provides storm water BMP inspection/maintenance guidelines.

TABLE 5-1
Storm Water Inspection/Maintenance Guidelines
Main Site Cover Construction
Former Celotex Site – Chicago, Illinois

EROSION CONTROL BLANKET

- Is fabric damaged, loose, or need repairs?

MULCHING

- Distributed uniformly?
- Any evidence of mulch being blown or washed away?

SILT FENCE

- Is the fence damaged, collapsed, or ineffective?
- Is excessive sedimentation against the fence present?
- Has sediment been removed from behind fence?
- Is the silt fence properly installed and positioned?

STRAW BALES

- Are the straw bales damaged or deteriorated, or ineffective?
- Has sediment been removed from behind the bales?
- Are the bales installed and positioned correctly?

TEMPORARY SEEDING

- Is the seeding protected by mulch?
- Has any erosion occurred in the seeded area?
- Any evidence of vehicle tracking on seeded areas?

VEHICLE TRACKING

- Is the gravel surface clogged with mud or sediment?
- Is the gravel surface sinking into the ground?
- Has sediment been tracked onto public roads? If yes, has it been cleaned up?

5.2 Requirements Prior to Final Stabilization

Inspections will be reduced to once per month after construction activities are complete. A record of these inspections will be maintained at the CH2M HILL field office.

6.0 Non-Storm Water Discharges

Discharges, other than storm water from construction activities, are not anticipated. However, the following discharges are allowable:

- Fire fighting activities
- Fire hydrant flushing
- Vehicle wash water (where detergents are not used)
- Water used to control dust
- Potable water sources (includes waterline flushing)
- External building washdown (which does not use detergents)
- Pavement washdown (where spills or leaks of toxic or hazardous materials have not occurred and where detergents are not used)
- Air conditioning condensate
- Uncontaminated groundwater or spring water
- Foundation or footing drains (where flows are not contaminated with process materials, such as solvents)

7.0 Contractor Certification

The Contractor Certification forms signed by CH2M HILL's subcontractors are provided in Appendix E.

8.0 Retention of Records

A copy of this SWP3 and all inspection reports are required to be maintained at the CH2M HILL field office during the duration of the construction period, project initiation through final stabilization. The SWP3, inspection records, and reports shall be retained for a period of at least 3 years from the date the areas are finally stabilized.

APPENDIX A

National Pollutant Discharge Elimination System General Permit (ILR10) for Storm Water Discharges from Construction Activity

NPDES Permit No. ILR10

Public Notice Beginning Date: June 6, 2008
Public Notice Ending Date: July 7, 2008

National Pollutant Discharge Elimination System (NPDES)
Permit Program

PUBLIC NOTICE/FACT SHEET
of
Reissued General NPDES Permit to Discharge Storm Water
From Construction Site Activities into Waters of the State

The Illinois Environmental Protection Agency (IEPA) has made a tentative determination to reissue NPDES General Permit No. ILR10 for the discharge of storm water associated with industrial activity from construction sites into waters of the state for the following types of dischargers:

Coverage under this permit

This Permit covers all areas
of the State of Illinois

Eligibility

1. This permit shall authorize all discharges of storm water associated with industrial activity from construction sites that will result in the disturbance of one or more acres total land area, construction sites less than one acre of total land that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb one or more acres total land area. Construction sites that are designated by the Agency that have the potential for contribution to a violation of water quality standards or significant contribution of pollutants to waters of the State, occurring after the effective date of this permit (including discharges occurring after the effective date of this permit where the construction activity was initiated before the effective date of this permit), except for discharges identified under paragraph I.B.3 (Limitations on Coverage) are also authorized by this permit.

2. This permit may only authorize a storm water discharge associated with industrial activity from a construction site that is mixed with a storm water discharge from an industrial source other than construction, where:

   a. the industrial source other than construction is located on the same site as the construction activity;

   b. storm water discharges associated with industrial activity from the areas of the site where construction activities are occurring are in compliance with the terms of this permit; and

   c. storm water discharges associated with industrial activity from the areas of the site where industrial activity other than construction are occurring (including storm water discharges from dedicated asphalt plants and dedicated concrete plants) are covered by a different NPDES general permit or individual permit authorizing such discharges.

3. **Limitations on Coverage**. The following storm water discharges from construction sites are not authorized by this permit:

   a. storm water discharges associated with industrial activity that originate from the site after construction activities have been completed and the site has undergone final stabilization.

   b. discharges that are mixed with sources of non-storm water other than discharges identified in Part III.A (Prohibition on Non-Storm Water Discharges) of this permit and in compliance with Part IV.D.5 (Non-Storm Water Discharges) of this permit.

   c. storm water discharges associated with industrial activity that are subject to an existing NPDES individual or general permit or which are issued a permit in accordance with Part VI.N (Requiring an Individual Permit or an Alternative General Permit) of this permit. Such discharges may be authorized under this permit after an existing permit expires provided the existing permit did not establish numeric limitations for such discharges.

   d. storm water discharges from construction sites that the Agency has determined to be or may reasonably be expected to be contributing to a violation of a water quality standard.

   e. Storm water discharges that the Agency, at its discretion, determines are not appropriately authorized or controlled by this general permit.

Final Conditions

Length of Permit:	Approximately 5 Years
Classification of Receiving Waters:	All surface waters of the State
Discharge No(s).:	Various Locations
Type of Waste	Storm Water Runoff
Flow Rate:	Varies

The general permit does not name any Permittees, nor does it authorize any person to discharge. The authorization to discharge under a general permit will be by separate letter, issued to a specific applicant. The letters can be issued at any time while the Permit is in effect.

Interested persons are invited to submit written comments on the draft permits to the IEPA at the above address. The NPDES permit number(s) must appear on each comment page. Any interested person may submit a written request for a public hearing on a draft permit, stating his or her name and address, the nature of the issues proposed to be raised and the evidence proposed to be presented with regards to those issues.

The Public Notice, Fact Sheet, draft permit, comments received, and other documents are available for inspection and may be copied at the IEPA between 9:30 a.m. and 3:30 p.m. Monday through Friday.

All comments on the draft permit and requests for hearing must be received by the IEPA not later than 30 days from the date of this publication. If written comments or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 30 days before any public hearing. For further information call the Public Notice Clerk at 217/782-0610.

Public Notice/Fact Sheet Issued By:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
217/782-0610

Part V. RETENTION OF RECORDS

A. The permittee shall retain copies of storm water pollution prevention plans and all reports and notices required by this permit, and records of all data used to complete the Notice of Intent to be covered by this permit, for a period of at least three years from the date that the permit coverage expires or is terminated. This period may be extended by request of the Agency at any time.

B. The permittee shall retain a copy of the storm water pollution prevention plan required by this permit at the construction site from the date of project initiation to the date of final stabilization.

Part VI. STANDARD PERMIT CONDITIONS

A. **Duty to Comply**.

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Illinois Environmental Protection Act and the CWA and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

B. **Continuation of the Expired General Permit**. This permit expires five years from the date of issuance. An expired general permit continues in force and effect until a new general permit or an individual permit is issued. Only those facilities authorized to discharge under the expiring general permit are covered by the continued permit.

C. **Need to halt or reduce activity not a defense**. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. **Duty to Mitigate**. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. **Duty to Provide Information**. The permittee shall furnish within a reasonable time to the Agency or local agency approving sediment and erosion plans, grading plans, or storm water management plans; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system with an NPDES permit, to the municipal operator of the system, any information which is requested to determine compliance with this permit. Upon request, the permittee shall also furnish to the Agency or local agency approving sediment and erosion plans, grading plans, or storm water management plans; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system with an NPDES permit, to the municipal operator of the system, copies of records required to be kept by this permit.

F. **Other Information**. When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the Agency, he or she shall promptly submit such facts or information.

G. **Signatory Requirements**. All Notices of Intent, storm water pollution prevention plans, reports, certifications or information either submitted to the Agency or the operator of a large or medium municipal separate storm sewer system, or that this permit requires be maintained by the permittee, shall be signed.

1. All Notices of Intent shall be signed as follows:

   a. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (1) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or (2) the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25,000,000 (in second-quarter 1980 dollars) if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

   b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

   c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (1) the chief executive officer of the agency, or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

2. All reports required by the permit and other information requested by the Agency shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described above and submitted to the Agency.

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).

   c. **Changes to authorization**. If an authorization under paragraph I.C (Authorization) is no longer accurate because a different individual or position has responsibility for the overall operation of the construction site, a new authorization satisfying the requirements of paragraph I.C must be submitted to the Agency prior to or together with any reports, information, or applications to be signed by an authorized representative.

   d. **Certification**. Any person signing documents under this Part shall make the following certification:

      "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

R. **Permit Actions**. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

Part VII. REOPENER CLAUSE

A. If there is evidence indicating potential or realized impacts on water quality due to any storm water discharge associated with industrial activity covered by this permit, the discharger may be required to obtain an individual permit or an alternative general permit in accordance with Part I.C (Authorization) of this permit or the permit may be modified to include different limitations and/or requirements.

B. Permit modification or revocation will be conducted according to provisions of 35 Ill. Adm. Code, Subtitle C, Chapter I and the provisions of 40 CFR 122.62, 122.63, 122.64 and 124.5 and any other applicable public participation procedures.

C. The Agency will reopen and modify this permit under the following circumstances:

1. the U.S. EPA amends its regulations concerning public participation;

2. a court of competent jurisdiction binding in the State of Illinois or the 7th Circuit issues an order necessitating a modification of public participation for general permits; or

3. to incorporate federally required modifications to the substantive requirements of this permit.

Part VIII. DEFINITIONS

"Agency" means the Illinois Environmental Protection Agency.

"Best Management Practices" ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

"Commencement of Construction" - The initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.

"CWA" means Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub.L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. (96-483 and Pub. L. 97-117, 33 U.S.C. 1251 et.seq.)

"Dedicated portable asphalt plant" - A portable asphalt plant that is located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR 443.

"Dedicated portable concrete plant" - A portable concrete plant that is located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

"Dedicated sand or gravel operation" - An operation that produces sand and/or gravel for a single construction project.
"Director" means the Director of the Illinois Environmental Protection Agency or an authorized representative.

"Final Stabilization" means that all soil disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 70% the cover for unpaved areas and areas not covered by permanent structures has been established or equivalent stabilization measures (such as the use of riprap, gabions or geotextiles) have been employed.

"Large and Medium municipal separate storm sewer system" means all municipal separate storm sewers that are either:

(i) Located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and G of 40 CFR Part 122); or

(ii) Located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties (these counties are listed in Appendices H and I of 40 CFR Part 122); or

(iii) Owned or operated by a municipality other than those described in paragraph (i) or (ii) and that are designated by the Director as part of the large or medium municipal separate storm sewer system.

"NOI" means notice of intent to be covered by this permit (see Part II of this permit.)

"Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharges. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

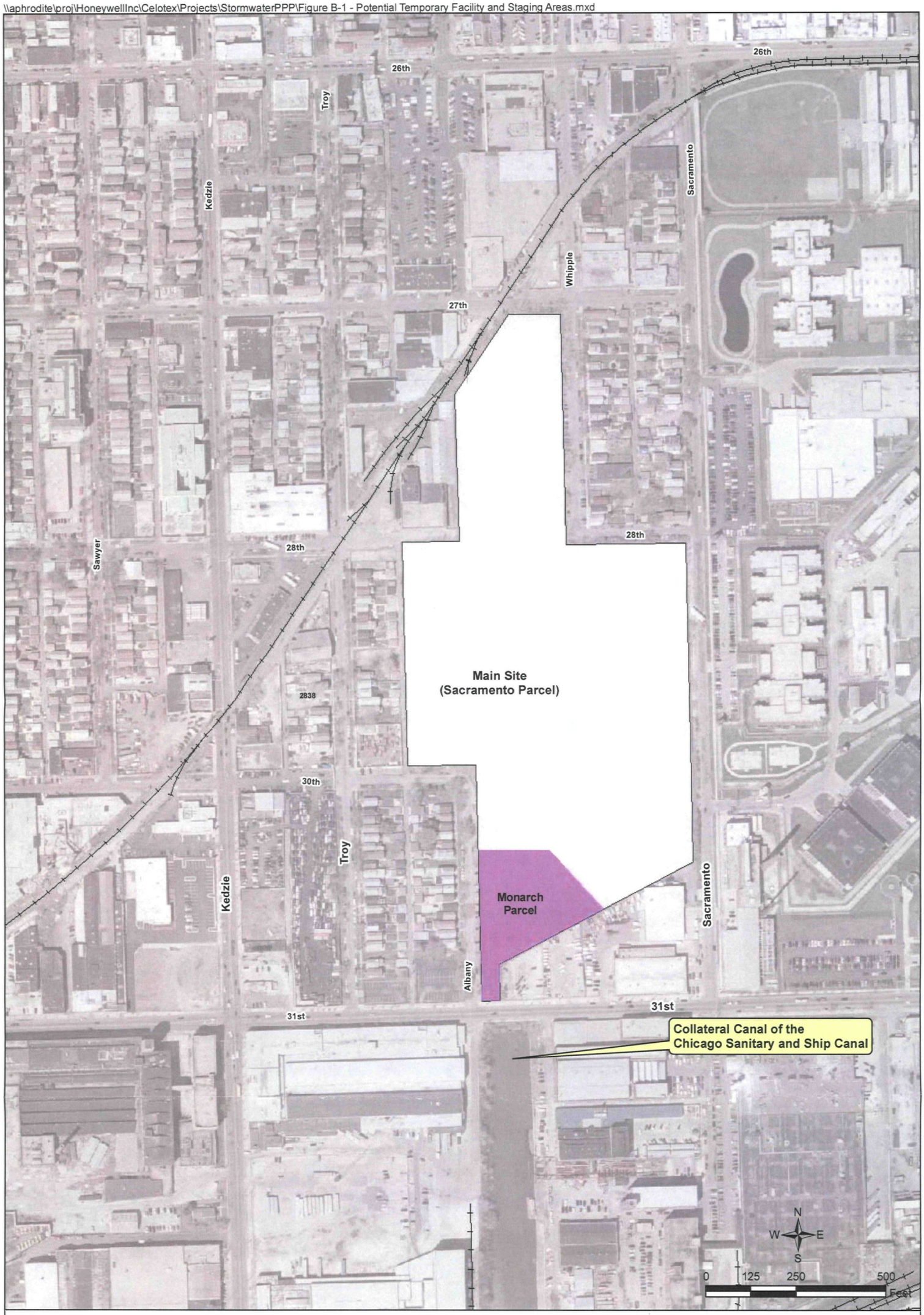
"Runoff coefficient" means the fraction of total rainfall that will appear at the conveyance as runoff.

"Storm Water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

APPENDIX B

Figures

\\aphrodite\proj\HoneywellInc\Celotex\Projects\StormwaterPPP\Figure B-1 - Potential Temporary Facility and Staging Areas.mxd

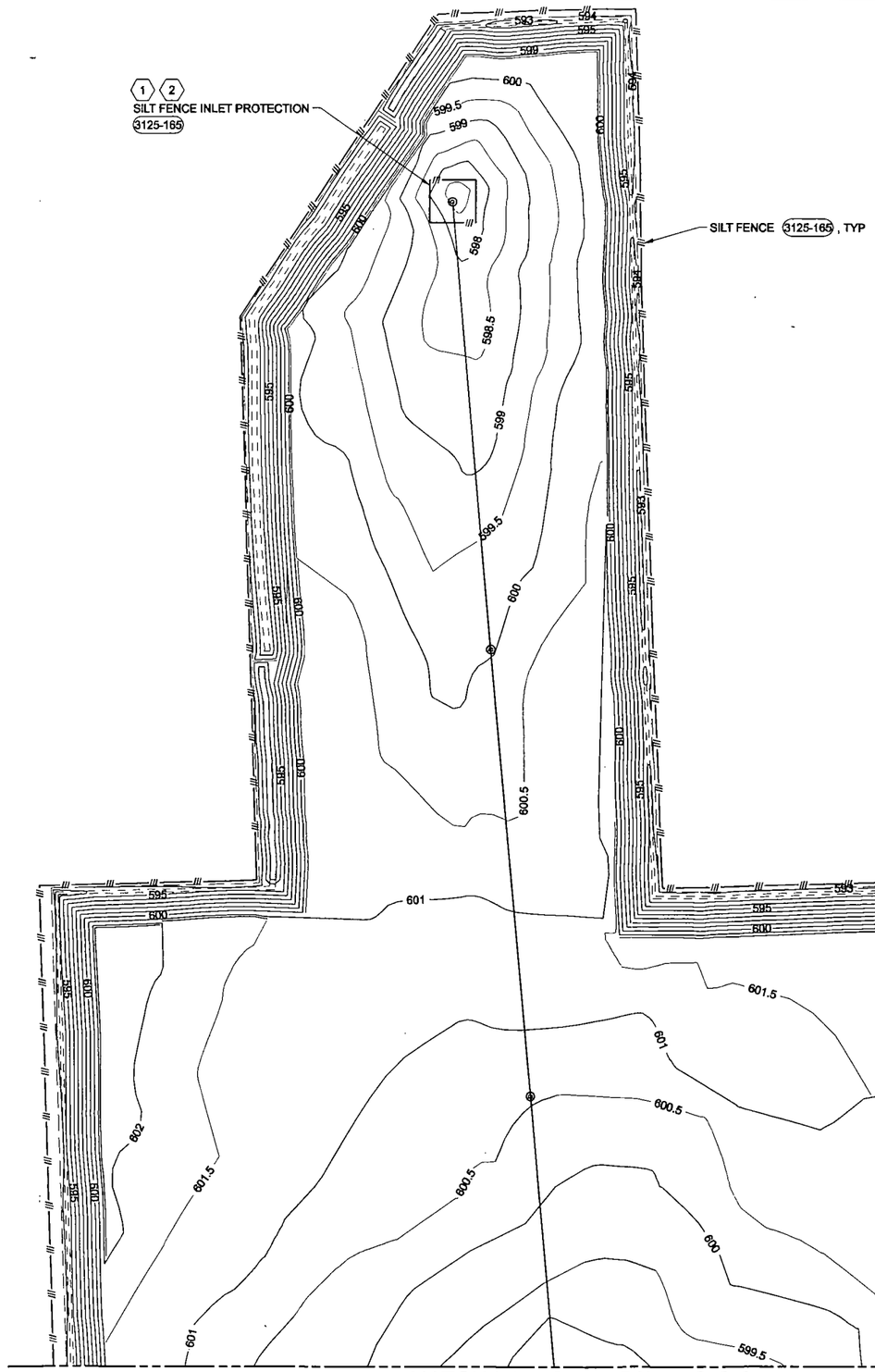


Legend

- Main Site
- Potential Staging/Equipment Storage Areas

Figure B-1
Potential Staging/Equipment Storage Areas and Soil Disturbance Areas
Stormwater Pollution Prevention Plan
Main Site Cover Construction
Former Celotex Site - Chicago, Illinois

CH2MHILL



KEY NOTES:
(NOTES APPLY TO DWGS C-5 AND C-6)

1. INSTALL PERIMETER SILT FENCE AROUND CATCH BASIN INLETS. EACH SIDE OF SILT FENCE SHALL BE A MINIMUM OF 10 FEET LONG.
2. INSTALL ALL SILT FENCE INLET PROTECTION DURING PHASE 1.
3. EXTEND GRAVEL ENTRANCE TO TOP OF SLOPE.
4. SUBCONTRACTOR SHALL COMPLY WITH THE CITY OF CHICAGO'S CONSTRUCTION SITE CLEANLINESS ORDINANCE.
5. STOCKPILE MATERIALS SHALL BE COVERED AS SPECIFIED AND AS SHOWN ON 3125-140

N

0 50 100 150
Scale In Feet

NO.	DATE	REVISION	BY	APVD
DSGN	BA BROWN	DR MA REICHERT	CHK AR JONES	APVD RA YOLO

CH2MHILL

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CIVIL
SEDIMENTATION AND EROSION CONTROL PLAN NORTH

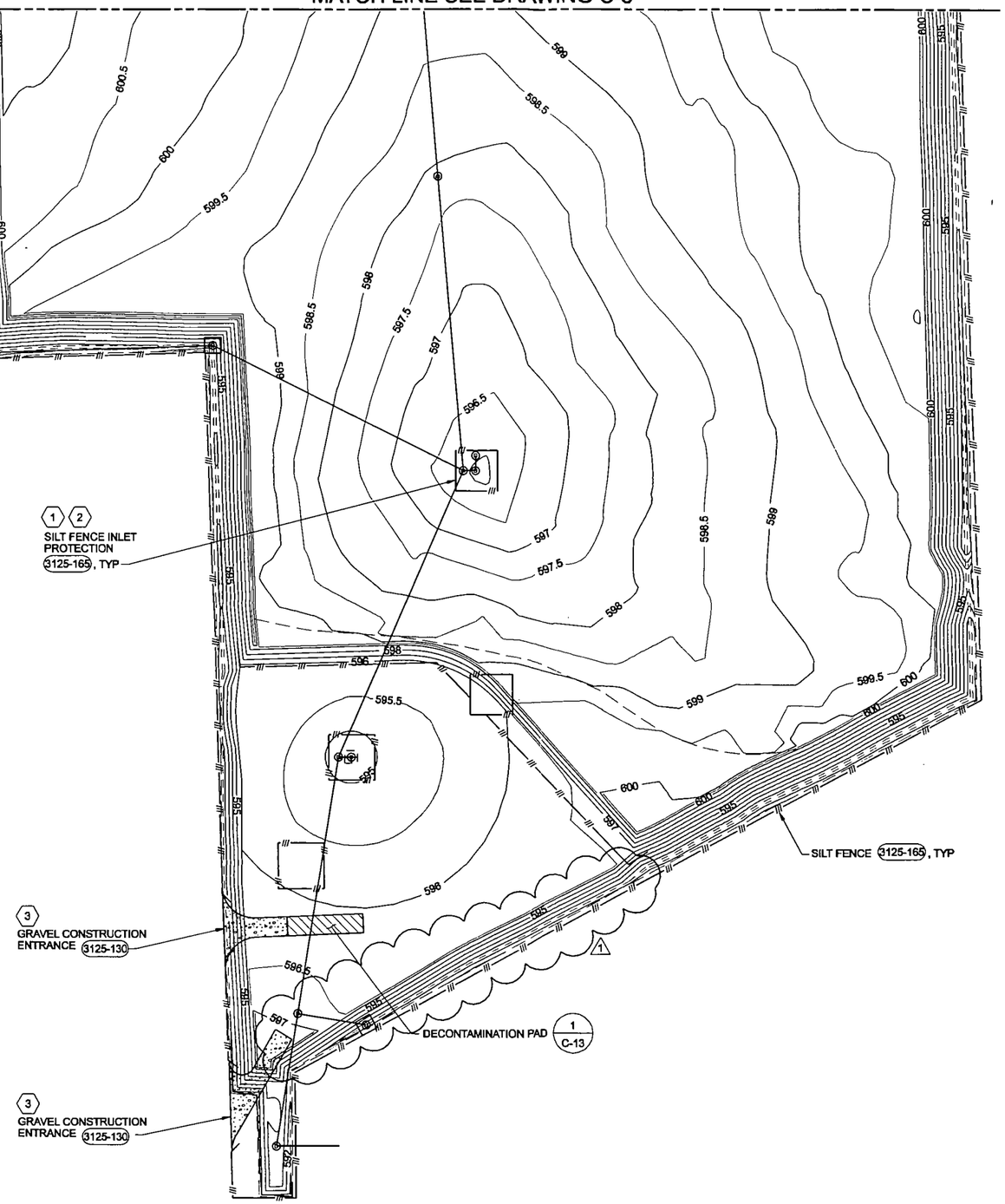
ISSUED FOR 80% REVIEW

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	327757
DWG	B-2
SHEET	

FILENAME: dn05c005_327757_figure_LED2.dgn PLOT DATE: 8/4/2008 PLOT TIME: 1:49:34 PM

MATCH LINE SEE DRAWING C-5



DRAWING NOTE:

1. REFER TO DRAWING C-5 FOR SEDIMENTATION AND EROSION CONTROL KEY NOTES.

N

0 50 100 150

Scale In Feet

NO.	DATE	REVISION	BY	APVD
DSGN	BA BROWN	DR MA REICHERT CHK AR JONES	APVD	RA YOLO

CH2MHILL

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

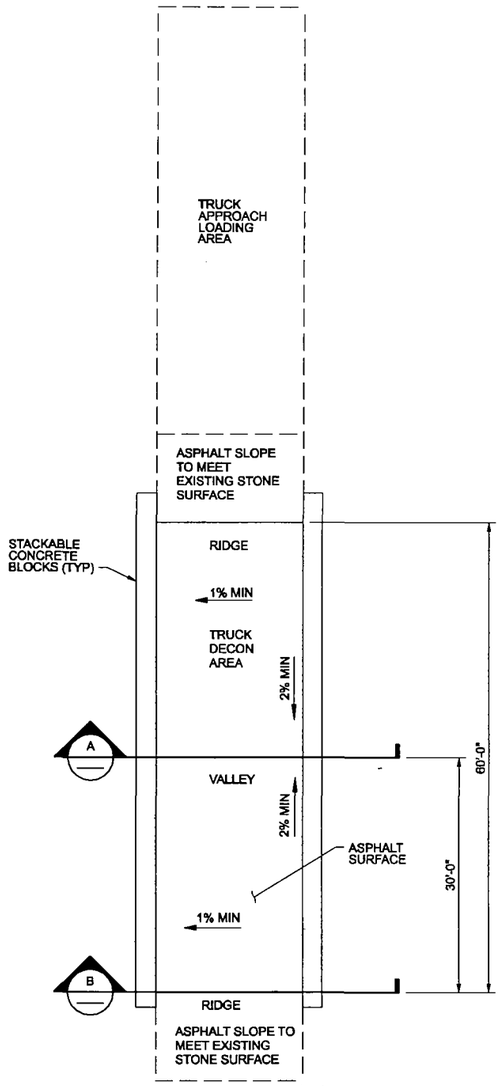
CIVIL
SEDIMENTATION AND EROSION CONTROL PLAN SOUTH

ISSUED FOR 90% REVIEW

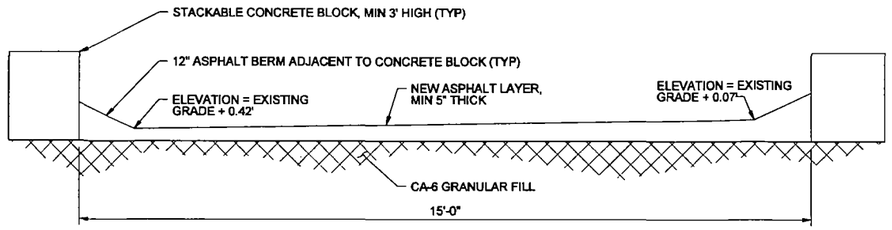
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	327757
DWG	B-3
SHEET	8

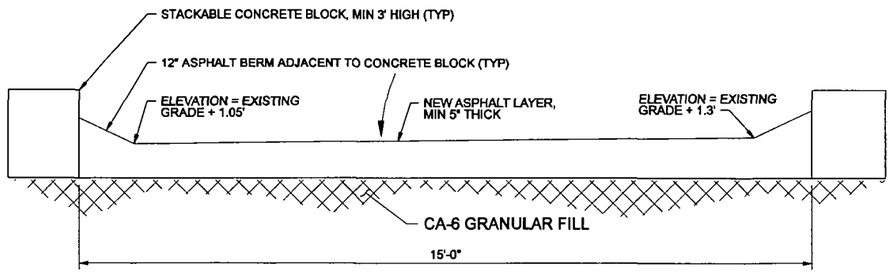
FILENAME: dn05c006_327757_figure_B-3.dgn PLOT DATE: 8/4/2008 PLOT TIME: 1:50:21 PM



TRUCK LOADING/DECON AREA PLAN
NTS



A TRUCK DECON AREA VALLEY
NTS



B TRUCK DECON AREA RIDGE
NTS

NOTES:

1. TRUCK DECON AREA TO BE CONSTRUCTED AND MAINTAINED BY CONTRACTOR.
2. NEW ASPHALT LAYER IS MINIMUM 5" THICK. MATERIAL BETWEEN NEW ASPHALT LAYER AND STONE SURFACE CAN BE APPROPRIATELY GRADED AND COMPACTED AGGREGATE.
3. MATERIALS AND SPECIFICATIONS FOR HEAVY VOLUME MIX SHALL CONFORM TO IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION UNLESS OTHERWISE NOTED.

1 DECONTAMINATION AREA
NTS

NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
		ENGINEER	MA GERIK	AR JONES			RA YOLO

REVISION

ISSUED FOR 80% REVIEW

HONEYWELL CELOTEX
MAIN SITE COVER CONSTRUCTION
CHICAGO, ILLINOIS
HONEYWELL INTERNATIONAL INC

CH2MHILL

CIVIL
DECONTAMINATION PAD DETAIL

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2008
PROJ	365109
DWG	B-4
SHEET	

FILENAME: dn05c013_327757_figure_LB-4.dgn DATE: 8/11/2008 PLOT TIME: 3:11:31 PM

APPENDIX C

SWP3 Inspection Checklist

SWP3 Inspection Checklist

Location of Inspection: _____ Date: _____

Inspector: _____ Company: _____

Inspection Procedure	Yes/No	Comments	Date of Corrective Action	Corrective Action Taken
Is there any evidence of sediment leaving the construction site? If so, note areas.				
Have any adverse impacts, such as, flooding, structural damage, erosion, spillage, or accumulation of sediment, debris, or litter occurred on adjacent property, wetlands, or surface waters?				
Have the storm water BMPs been placed properly and effectively?				
Are the storm water BMPs functioning as intended?				
Is there evidence of discharges or spills of fuels or lubricants?				

APPENDIX D

List of Materials Stored Onsite Form

LIST OF MATERIALS STORED ONSITE

Project Name: _____Celotex Residential Removal Action_____ Date: _____

Description of Material	Period on Site	Quantity	Location of Storage	Method of Storage	Description of Material Management Practices

APPENDIX E

Contractor Certification

Contractor Certification

(To be signed following project implementation)

"I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit (ILR10) that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification."

Signature:

Name (Printed or Typed):

Title:

Certification Date:

Company:

Address:

Telephone Number:

Site Address:

2800 South Sacramento, Chicago, IL, 60623

APPENDIX F

SWP3 Certification

Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature: Chuck Geadelmann

Name (Printed or Typed): Chuck Geadelmann

Title: Corporate Manager

Certification Date: 8/8/08

APPENDIX G

Miscellaneous Forms

TEMPORARY OR PERMANENT STOP WORK RECORDS

Location: _____

TEMPORARY OR PERMANENT	DATE STARTED	DATE ENDED	LOCATION	REMARKS

MAJOR GRADING RECORDS

Location: _____

DATE STARTED	DATE ENDED	LOCATION	REMARKS

STABILIZATION RECORDS

Location: _____

TYPE	DATE STARTED	DATE ENDED	LOCATION	REMARKS

Attachment 6 – Plat of Survey

(2 copies)

Two copies of the original Plat of Survey were included in the original application to the City of Chicago Building Department. Copies of the Plat of Survey are available upon request in electronic format.

Attachment 7 – Building Code Matrix

CITY OF CHICAGO DEPARTMENT OF CONSTRUCTION AND PERMITS

GENERAL BUILDING REQUIREMENTS Per Chicago Zoning Ordinance(CZO) and Chicago Building Code (CBC) 2002 Edition

ITEM	ISSUE	CHAPTER/ ARTICLE	Ordinance Requirement	Actual	Requirement N/A	Location/ Sheet No	Agency/ Test No.	REMARKS
ZONING REQUIREMENTS								
1.01	Zoning District	CZO Title 17				1		M2-3
1.02	Lot Area							19.7 Acres
BUILDING REQUIREMENTS								
2.01	Class J, miscellaneous buildings and structures.	13-56-220						
	a) Fences	13-96-120	X	X				New fence installed around perimeter